

EDITORIAL

The Evolving Landscape of Prosthodontics-Enhancing Quality of Life through Advanced Dentistry

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Prosthodontics, the dental specialty focused on the design, creation, and fixing of artificial replacements for teeth and other parts of the face, is experiencing rapid advancements. Our field faces a unique set of challenges and opportunities driven by technological innovation, demographic shifts, and evolving patient expectations.¹

The primary challenge in prosthodontics is the increasing complexity of patient needs. As the population ages, the demand for prosthetic solutions that cater to the elderly, who often present with multiple health issues and complex dental history, is rising.² This demographic shift necessitates a multidisciplinary approach to treatment, integrating prosthodontics with geriatric medicine, cardiology, and other specialties to ensure comprehensive care.³ Another significant challenge is the high cost of prosthodontic treatments. Advanced procedures, such as dental implants and full-mouth reconstructions, can be prohibitively expensive for many patients.⁴ This financial barrier limits access to essential dental care and highlights the need for more affordable solutions and insurance reforms to make these treatments more accessible.^{5,6}

Additionally, prosthodontics faces a continuous battle against patient fear and anxiety. Dental procedures, especially those involving significant reconstruction, can be daunting.⁷ Addressing this challenge requires not only advancements in pain management and sedation techniques but also improved patient education and communication to demystify the procedures and set realistic expectations.^{8,9}

Despite these challenges, the field of prosthodontics is ripe with opportunities. Technological advancements are at the forefront of this evolution. Digital dentistry, encompassing CAD/CAM technology, 3D printing, and intraoral scanning, is revolutionizing the way prosthodontists design and fabricate dental prostheses. These technologies enable more precise, efficient, and customizable treatments, improving both the clinician's workflow and patient outcomes.¹⁰

The yardstick for success in prosthodontics has traditionally been subjective, lacking a standardized method for evaluating treatment outcomes. In the

past, assessments were based largely on personal evaluations by dentists, which could be prone to errors.¹¹ Additionally, patients often had insufficient knowledge and compliance, further complicating the evaluation process. The specialty itself suffers from poorly defined boundaries, making it difficult to assess the current status of research on prosthodontic materials.¹² To address these issues, it is essential to rigorously evaluate and assess technical skills during undergraduate and postgraduate education. Early implementation and accessibility of digital tools should also be introduced to improve the accuracy and consistency of treatment assessments.

Higher education in prosthodontics is being transformed by the incorporation of virtual learning, simulation learning, and haptic learning technologies. Virtual learning platforms enable students to access a vast array of resources and lectures from anywhere, fostering a flexible and comprehensive educational environment.^{13,14} Simulation learning allows students to practice and refine their skills in a risk-free, controlled setting, using advanced software to replicate real-life scenarios and procedures. Haptic learning, which involves tactile feedback technology, further enhances this experience by allowing students to feel the textures and resistance they would encounter in actual dental treatments.^{15,16} These innovative educational tools collectively provide a more interactive and immersive learning experience, better preparing students for clinical practice and ensuring they are adaptive with the latest technological advancements in prosthodontics. By establishing clearer guidelines and incorporating advanced technology, the field can move towards more objective and reliable measures of success.¹⁷ Moreover, the integration of artificial intelligence (AI) and machine learning in diagnostic and treatment planning processes offers tremendous potential. AI can assist in analyzing complex cases, predicting treatment outcomes, and personalizing patient care plans, thereby enhancing the overall quality of care.¹⁸

Research and development in biomaterials also present significant opportunities. Innovations in biocompatible materials, such as ceramics and

advanced composites, promise more durable and aesthetically pleasing prosthetic solutions.¹⁹ These materials not only improve the longevity and function of prostheses but also enhance patient satisfaction by closely mimicking the natural appearance and feel of teeth.²⁰

Furthermore, the rise of telehealth and teledentistry opens new avenues for prosthodontic care providing a global reach. Remote consultations and digital monitoring can make specialist care more accessible, particularly for patients in rural or underserved areas.²¹ This shift towards a more connected and digital healthcare ecosystem which can bridge gaps in access to care and streamline the treatment process.²²

Treatment strategies should not be limited to a single discipline. Instead, the chosen treatment should consider the patient's mindset, the available dental materials, and the latest techniques and approaches. Therefore, a multidisciplinary approach is essential for effective treatment planning. Additionally, it is crucial to involve specialists from various fields to ensure comprehensive care, taking into account the patient's overall health, preferences, and the most current advancements in dental technology. This collaborative approach enhances the quality and outcomes of the treatment.^{3,23}

The future of prosthodontics is undoubtedly promising, yet it requires a concerted effort from practitioners, researchers, and policymakers to navigate the accompanying challenges.^{24,25} Emphasizing patient-centered care, investing in continuous education and training for dental professionals, and advocating for policy changes to improve access and affordability will be crucial.

The elderly population is vulnerable to various biological, social, and psychological issues, with those living in rural areas being particularly affected. Unlike their urban counterparts, the rural aging population tends to be illiterate, impoverished, and uninformed. Additionally, the migration of younger individuals to urban areas for better financial and employment prospects exacerbates the situation. Consequently, an educational and motivational program should aimed at raising prosthodontic awareness.²⁶

As we embrace the opportunities brought forth by technological advancements and demographic changes, the goal remains steadfast: to enhance the quality of life for patients through innovative, effective, and compassionate prosthodontic care.²⁷ These innovations allow for more precise, efficient, and customized solutions, improving the accuracy of restorations and reducing treatment times. Moreover, the integration of digital workflows facilitates better communication between dental

professionals and laboratories, ensuring a higher standard of care. The journey ahead is challenging, but with a proactive and adaptive approach, the field of prosthodontics can continue to make remarkable strides in improving oral health outcomes globally.²⁸

CONFLICT OF INTEREST

There is no conflict of interest

REFERENCES

1. Carlsson GE, Omar R. Trends in Prosthodontics. *Medical Principles and Practice* [Internet]. 2006 Apr 1 [cited 2024 Jun 3];15(3):167–79. Available from: <https://dx.doi.org/10.1159/000092177>
2. Geriatric prosthodontics: an overview. Part I. Pretreatment considerations - PubMed [Internet]. [cited 2024 Jun 3]. Available from: <https://pubmed.ncbi.nlm.nih.gov/8362037/>
3. Malament KA, Margvelashvili-Malament M, Natto ZS, Thompson V, Rekow D, Att W. Comparison of 16.9-year survival of pressed acid etched e.max lithium disilicate glass-ceramic complete and partial coverage restorations in posterior teeth: Performance and outcomes as a function of tooth position, age, sex, and thickness of ceramic material. *Journal of Prosthetic Dentistry* [Internet]. 2021 Oct 1 [cited 2024 Jun 3];126(4):533–45. Available from: <http://www.thejpd.org/article/S0022391320304510/fulltext>
4. Srinivasan M, Kalberer N, Fankhauser N, Naharro M, Maniewicz S, Müller F. CAD-CAM complete removable dental prostheses: A double-blind, randomized, crossover clinical trial evaluating milled and 3D-printed dentures. *J Dent*. 2021 Dec 1;115:103842.
5. Biordi DL, Heitzer M, Mundy E, DiMarco M, Thacker S, Taylor E, et al. Improving access and provision of preventive oral health care for very young, poor, and low-income children through a new interdisciplinary partnership. *Am J Public Health* [Internet]. 2015 Apr 1 [cited 2024 Jun 3];105:e26–9. Available from: <https://ajph.aphapublications.org/doi/10.2105/AJPH.2014.302486>
6. Gallagher P, Desmond D. Measuring quality of life in prosthetic practice: benefits and challenges. <http://dx.doi.org/101080/03093640600988633> [Internet]. 2007 Jun 1 [cited 2024 Jun 3];31(2):167–76. Available from: <https://journals.sagepub.com/doi/full/10.1080/03093640600988633>
7. Sawy AA El, Amal A. El Sawy Anxiety level and Difficult Patients in Prosthodontic Clinic. *Journal of American Science* [Internet]. 2012 [cited 2024 Jun

- 3];8(1):1545–1003. Available from: <http://www.americanscience.org><http://www.americanscience.org>editor@americanscience.org<http://www.americanscience.org>38
- 8.Ennion L, Rhoda A. Roles and challenges of the multidisciplinary team involved in prosthetic rehabilitation, in a rural district in South Africa. *J Multidiscip Healthc* [Internet]. 2016 Oct 31 [cited 2024 Jun 3];9:565–73. Available from: <https://pubmed.ncbi.nlm.nih.gov/27826195/>
- 9.Textbook | Functional Occlusion From TMJ to Smile Design [Internet].... <https://thedawsonacademy.com/store/textbooks/functional-occlusion-tmj-smile-design/>
- 10.Joda T, Zarone F, Ferrari M. The complete digital workflow in fixed prosthodontics: a systematic review. *BMC Oral Health* [Internet]. 2017 Sep 19 [cited 2024 Jun 3];17(1). Available from: <https://pubmed.ncbi.nlm.nih.gov/28927393/>
- 11.Alkhdary MA, Farah RI, Ghobashy AI. Competency-based education in undergraduate clinical prosthodontics: A paradigm shift in training. *The Journal of Competency-Based Education* [Internet]. 2020 Sep 1 [cited 2024 Jun 3];5(3):e01220. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1002/cbe2.1220>
- 12.Sampaio-Fernandes M, Dutra M, Oliveira SJ, Reis-Campos JC, Azevedo Á, Figueiral MH. Students' self-confidence and perceived quality of prosthodontics education: A study in the Faculty of Dental Medicine of the University of Porto. *European Journal of Dental Education* [Internet]. 2020 Aug 1 [cited 2024 Jun 3];24(3):559–71. Available from: https://www.researchgate.net/publication/341115725_Students'_self-confidence_and_perceived_quality_of_prosthodontics_education_A_study_in_the_Faculty_of_Dental_Medicine_of_the_University_of_Porto
- 13.Mahrous A, Schneider GB. Enhancing Student Learning of Removable Prosthodontics Using the Latest Advancements in Virtual 3D Modeling. *J Prosthodont* [Internet]. 2019 Apr 1 [cited 2024 Jun 3];28(4):471–2. Available from: <https://pubmed.ncbi.nlm.nih.gov/30838728/>
- 14.Goodacre CJ. Digital Learning Resources for Prosthodontic Education: The Perspectives of a Long-Term Dental Educator Regarding 4 Key Factors. *Journal of Prosthodontics* [Internet]. 2018 Dec 1 [cited 2024 Jun 3];27(9):791–7. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1111/jopr.12987>
- 15.Performance of dental students versus prosthodontics residents on a 3D immersive haptic simulator - PubMed [Internet]. [cited 2024 Jun 3]. Available from: <https://pubmed.ncbi.nlm.nih.gov/24706694/>
- 16.Simulation-Based Dental Education: An International Consensus Report [Internet]. [cited 2024 Jun 3]. Available from: https://www.researchgate.net/publication/353606212_Simulation-Based_Dental_Education_An_International_Consensus_Report
- 17.Felton D, Cooper L, Duqum I, Minsley G, Guckes A, Haug S, et al. Evidence-based guidelines for the care and maintenance of complete dentures: a publication of the American College of Prosthodontists. *J Prosthodont* [Internet]. 2011 Feb [cited 2024 Jun 4];20 Suppl 1(SUPPL. 1). Available from: <https://pubmed.ncbi.nlm.nih.gov/21324026/>
- 18.Singi SR, Sathe S, Reche AR, Sibal A, Mantri N. Extended Arm of Precision in Prosthodontics: Artificial Intelligence. *Cureus* [Internet]. 2022 Nov 1 [cited 2024 Jun 4];14(11). Available from: <https://pubmed.ncbi.nlm.nih.gov/36465202/>
- 19.Blatz MB, Chiche G, Bahat O, Roblee R, Coachman C, Heymann HO. Evolution of Aesthetic Dentistry. *J Dent Res* [Internet]. 2019 Nov 1 [cited 2024 Jun 4];98(12):1294–304. Available from: <https://pubmed.ncbi.nlm.nih.gov/31633462/>
- 20.AlJehani YA, Baskaradoss JK, Geevarghese A, AlShehry MA. Current Trends in Aesthetic Dentistry. *Health N Hav*. 2014;06(15):1941–9.
- 21.Minervini G, Russo D, Herford AS, Gorassini F, Meto A, D'Amico C, et al. Teledentistry in the Management of Patients with Dental and Temporomandibular Disorders. *Biomed Res Int* [Internet]. 2022 [cited 2024 Jun 4];2022. Available from: https://www.researchgate.net/publication/359858948_Teledentistry_in_the_Management_of_Patients_with_Dental_and_Temporomandibular_Disorders
- 22.Estai M, Kanagasigam Y, Tennant M, Bunt S. A systematic review of the research evidence for the benefits of teledentistry. *J Telemed Telecare* [Internet]. 2018 Apr 1 [cited 2024 Jun 4];24(3):147–56. Available from: <https://pubmed.ncbi.nlm.nih.gov/28118778/>
- 23.Abduo J, Lyons KM. Interdisciplinary interface between fixed prosthodontics and periodontics. *Periodontol 2000* [Internet]. 2017 Jun 1 [cited 2024

Jun 4];74(1):40–62. Available from: <https://pubmed.ncbi.nlm.nih.gov/28429481/>

24. Morgano SM, Brackett SE. Foundation restorations in fixed prosthodontics: current knowledge and future needs. *J Prosthet Dent* [Internet]. 1999 [cited 2024 Jun 4];82(6):643–57. Available from:

<https://pubmed.ncbi.nlm.nih.gov/10588800/>

25. Al-Sowaygh ZH, Sukotjo C. Advanced education in prosthodontics: residents' perspectives on their current training and future goals. *J Prosthodont* [Internet]. 2010 Feb [cited 2024 Jun 4];19(2):150–6. Available from:

<https://pubmed.ncbi.nlm.nih.gov/20002976/>

26. Parlani et al. 2011 dentistry - Google Search [Internet]. [cited 2024 Jun 4]. Available from: https://www.google.com/search?q=%28Parlani+et+al.+2011%29+dentistry&sca_esv=ca30eee42ebf7bd1&sca_upv=1&rlz=1C1CHBF_enIN1091IN1092&sxsrf=ADLYWIKmzLI32_td62FNVKJFnIDLf

OZeUQ%3A1717481794001&ei=QbFeZu7ZPOSZseMP556B0Ak&ved=0ahUKEwIU_vShpsGGAxXkTGwGHwDPAJoQ4dUDCBA&uact=5&oq=%28Parlani+et+al.+2011%29+dentistry&gs_l=egxnd3Mtd2l6LXNlcnAiIC4oUGFybGFuaSBldCBhbC4gMjAxMSkgZGVudGlzdHJ5MgcQIRigARgKMgcQIRigARgKSOIbUPYDWJEXcAF4AJABAJgBiwKgAbYQqgEFMC4lJw4AQPIAQD4AQGYAguAvIQwgILEAAYgAQYsAMYogTCAGQQIRgVmAMAIAYBkAYDkgcFMS4lJWgB60k&scient=gws-wiz-serp

27. Oral prostheses and oral health-related quality of life: A survey study of an adult Swedish population | Request PDF [Internet]. [cited 2024 Jun 4]. Available from:

https://www.researchgate.net/publication/6374566_Oral_prostheses_and_oral_health-related_quality_of_life_A_survey_study_of_an_adult_Swedish_population

28. Thornton PH, Ocasio W, Lounsbury M. The institutional logics perspective : a new approach to culture, structure, and process. 2012;234.

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