



CRYSTAL-CLEAR VISION: Dental operating microscopes in modern dentistry

Kevin Ohashi Lopez, MHA, BSDH, RDH
Claudia Walder, BSDH, BA, RDH, CDA

Let's take a journey into the future of dentistry, where precision meets innovation and crystal-clear vision transforms patient care. We'll discover the game-changing realm of dental operating microscopes (DOMs)—the unsung heroes that redefine ergonomics and elevate the standards of preventive dentistry.

This fusion of technological advancement and clinical expertise promises a shift in how dental professionals approach preventive care. The possibilities are expanded with DOMs, offering high levels of clarity in vision and precision in care delivery for all dental professionals, including dental hygienists.

Dental professional calibration

DOMs not only enhance collaboration between hygienists and other clinicians but also redefine the calibration of dental professionals toward precision and excellence. Beyond the conventional methods, DOMs can revolutionize the way clinicians verify the completeness of their procedures. Allowing magnification manipulation without needing to change loupes, DOMs ensure meticulous hygiene services and a pristine working area, laying the foundation for potential subsequent restorative care.¹

The live video feeds and captured images DOM technology provides serve as invaluable tools for education and documentation. Not only do the records illustrate oral conditions, but they also emphasize the significance of preventive care, fostering patient compliance and paving the way for comprehensive

treatment planning. With such advanced calibration, dental professionals can deliver unparalleled care, setting new standards in preventive dentistry and patient satisfaction.²

Ergonomic evolution

DOMs can herald a new era of comfort and efficiency for clinicians. The adjustable configurations of DOMs allow for personalized setup, ensuring neutral posture alignment and reducing strain on critical areas such as the neck, shoulder, and back. This ergonomic evolution promotes prolonged comfort and minimizes the risk of musculoskeletal disorders, safeguarding the well-being of clinicians.

With magnification levels surpassing those of conventional loupes, DOMs offer enhanced precision and reduced visual fatigue, enabling clinicians to focus solely on delivering high-quality care.³ Whether the DOM is mounted from the ceiling, on a dental chair arm, or on a cart, weight-bearing burdens for the clinician are eliminated, thus encouraging clinical ergonomic efficiency. DOMs redefine ergonomics and empower clinicians to excel in their practice, driving up the standard of care.

Precision beyond loupes

Although loupes are an indispensable tool in clinical practice, DOMs can represent a quantum leap in precision and control. With integrated lighting systems adjunctive to customizable configurations, dental clinicians can take advantage of unprecedented control over their procedures, resulting in optimal outcomes for patients. This enhanced precision is particularly striking in a range of dental procedures—commonly known in endodontic therapy and gaining more

popularity in restorative procedures and periodontal interventions.

By enhancing visualization and control, DOMs streamline efficiency and effectiveness, marking a significant advancement in dental technology, especially dental hygiene.⁴ Additionally, patient outcomes are optimized by enabling clinicians to navigate complex working areas generally unseen with conventional loupes. This accuracy could surpass current magnification limitations and redefine the visual standard in modern dentistry.⁵

Elevating clinical efficiency for dental hygienists

Integrating DOMs in dental hygiene heralds a paradigm shift toward enhanced clinical efficiency. Hygienists have traditionally relied on instrumentation and visual inspection when providing hygiene services. However, with assistance from DOMs, hygienists could enhance their precision in debridement with greater accuracy and minimal tissue trauma.^{6,7}

DOMs enable a more detailed assessment of dental structures, helping hygienists identify early signs of disease and other pathologies, which facilitates timely intervention and minimally invasive preventive care.⁸ With multifaceted benefits ranging from enhanced diagnostics to personalized treatment approaches, DOMs can enhance the practice of dental hygiene, setting new standards in our approach to excellence and patient-centered care.

A promising future for preventive dentistry

Through this journey, it is evident that these innovative tools hold significant promise for the future of preventive

dentistry. The transformative potential of this “point of view” could be a catalyst for change in the hygiene profession.

From enhancing precision and ergonomics to revolutionizing clinical efficiency and outcomes, DOMs truly propel the industry forward. As we continue to integrate advancements into everyday practice, innovations and clinical excellence will converge to redefine the standards of care. Through collaboration, education, and shared commitment to patient-centered dentistry, we can utilize the potential of DOMs to give us better insight into oral health outcomes, improving the well-being of our patients. **RDH**

REFERENCES

- Eichenberger M, Biner N, Amato M, Lussi A, Perrin P. Effect of magnification on the precision of tooth preparation in dentistry. *Oper Dent*. 2018;43(5):501-507. doi:10.2341/17-169-C
- Mallikarjun SA, Devi PR, Naik AR, Tiwari S. Magnification in dental practice: how useful is it? *J Health Res Rev*. 2015;2(2):39-44. doi:10.4103/2394-2010.160903
- Bud M, Jitaru S, Lucaciu O, et al. The advantages of the dental operative microscope in restorative dentistry. *Med Pharm Rep*. 2021;94(1):22-27. doi:10.15386/MPR-1662
- Bonsor SJ. The use of the operating microscope in general dental practice. Part 2: If you can see it, you can treat it! *Dent Update*. 2015;42(1):60-66. doi:10.12968/denu.2015.42.1.60

- Bud MG, Pop OD, Cimpean S. Benefits of using magnification in dental specialties – a narrative review. *Med Pharm Rep*. 2023;96(3):254-257. doi:10.15386/MPR-2556
- Sugiyama Y, Takayama Y. Improve the certainty of periodontal treatment! Microscope tips for more visibility. *J Dent Hyg*. 2023;47(4):76-79.
- Hegde R, Sumanth S, Padhye A. Microscope-enhanced periodontal therapy: a review and report of four cases. *Journal of Contemporary Dental Practice*. September 1, 2009. <https://www.thejcdp.com/doi/pdf/10.5005/jcdp-10-5-88>
- Mamoun J. Use of high-magnification loupes or surgical operating microscope when performing prophylaxes, scaling or root planing procedures. *N Y State Dent J*. 2013;79(5):48-52.

Kevin Ohashi Lopez, MHA, BSDH, RDH

Kevin is a San Francisco-based dental hygienist. He graduated from West Coast University in 2019 and obtained a master's in health administration. Currently practicing in Napa Valley, Kevin brings diverse dental experience, with both front- and back-office expertise. He is a speaker, ambassador, mentor, Guided Biofilm Therapy trainer with the Swiss Dental Academy, and National Board Dental Hygiene Examination (NBDHE) review faculty with Sanders Board Preparatory. Connect with him on Instagram @kevstalksteeth or via email at hello@kevstalksteeth.com.

Claudia Walder, BSDH, BA, RDH, CDA

Claudia has spent 20 years practicing as a registered dental hygienist and currently works in Southern California. She has practiced nationally and in Switzerland serving in private, nonprofit, general, periodontal, and pediatric practices. She is passionate about education and loves sharing information about oral health-care aids with dental professionals, students, and patients.

MITOCHONDRIAL DYSFUNCTION

continued from p.39

dysfunction? *Periodontol* 2000. 2014;64(1):139-153. doi:10.1111/j.1600-0757.2012.00455.x

- Bolisetty S, James EA. Mitochondria and reactive oxygen species: physiology and pathophysiology. *Int J Mol Sci*. 2013;14(3):6306-6344. doi:10.3390/ijms14036306
- Chiu AV, Saigh MA, McCulloch CA, Glogauer M. The role of NrF2 in the regulation of periodontal health and disease. *J Dent Res*. 2017;96(9):975-983. doi:10.1177/0022034517715007
- Govindaraj P, Khan NA, Gopalakrishna P, et al. Mitochondrial dysfunction and genetic heterogeneity in chronic periodontitis. *Mitochondrion*. 2011;11(3):504-512. doi:10.1016/j.mito.2011.01.009
- Xu T, Dong Q, Luo Y, et al. *Porphyromonas gingivalis* infection promotes mitochondrial dysfunction through Drp1-dependent mitochondrial fission in endothelial cells. *Int J Oral Sci*. 2021;13(1):28. doi:10.1038/s41368-021-00134-4. Erratum in: *Int J Oral Sci*. 2022;14(1):3. doi:10.1038/s41368-021-00153-1
- Mei F, Xie M, Huang X, et al. *Porphyromonas gingivalis* and its systemic impact: current status. *Pathogens*. 2020;9(11):944. doi:10.3390/pathogens9110944
- Deng Y, Xiao J, Ma L, et al. Mitochondrial dysfunction in periodontitis and associated systemic diseases: implications for pathomechanisms and therapeutic strategies. *Int J Mol Sci*. 2024;25(2):1024. doi:10.3390/ijms25021024

Anne O. Rice, BS, RDH, CDP, FAAOSH

Anne founded Oral Systemic Seminars after almost 30 years of clinical practice and is passionate about educating the community on modifiable risk factors for dementia and their relationship to dentistry. She is a certified dementia practitioner, a longevity specialist, a fellow with AAOSH, and has consulted for Weill Cornell Alzheimer's Prevention Clinic, FAU, and Atria Institute. Reach out to Anne at anneorice.com.

Give us a call or visit us online. We're here to help!
1-800-247-3368 • www.bisco.com



More FREE facts, Circle 15 on card.