

# Why Personalized Oral Hygiene Technology Matters

Susan Wingrove, BS, RDH

**D**ental professionals are in a unique position to help their patients personalize their brushing experience to better meet their specific oral health needs, whether for natural teeth (eg, misalignment), implants, or during orthodontic treatment. By exceeding patients' expectations and achieving improved oral health outcomes, clinicians can elevate their practice.

This supplement to *Compendium of Continuing Education in Dentistry* presents the latest evidence-based research that demonstrates how patients' oral hygiene regimens can be individualized by selecting oral hygiene aids that meet their specific clinical or motivational needs without compromising on efficacy. This also gives clinicians the tools to provide effective and impactful oral hygiene guidance to their patients.

Research shows that removal of 80% to 85% of oral biofilm twice daily as part of a patient's oral hygiene routine effectively controls the biofilm.<sup>1</sup> This is not only critical for patients' oral health, but it also has implications on their overall health. Bacterial biofilm, together with inflamed gingival epithelium, creates a corridor directly from the oral cavity to the systemic circulation, and evidence shows there is an association between oral health and certain diseases.<sup>2</sup> Oral hygiene technology has advanced to address the need to control oral biofilm in a personalized way; this includes innovations in electric toothbrush technology. According to the American College of Prosthodontists' Clinical Practice Guidelines for recall and maintenance of patients with tooth-borne and implant-borne restorations, patients should be using an electric toothbrush to effectively remove biofilm as one of the specific oral hygiene aids for at-home maintenance.<sup>3</sup>

## Oral-B® iO™ Electric Toothbrush for Personalized Brushing

Among electric toothbrush technologies, the oscillating-rotating (O-R) technology by Oral-B stands out, with meta-analyses showing 50% greater reduction in bleeding sites compared to manual brushes and 28% greater reduction in bleeding sites versus sonic (side-to-side motion) brushes.<sup>4</sup> Oral-B's most recent advancement in oral hygiene technology is the Oral-B iO (Figure 1).<sup>5</sup> A next-generation O-R electric toothbrush with micro-vibrations, the Oral-B iO has a patented linear magnetic drive system to efficiently deliver energy to the tips of the bristles where they can most effectively disrupt and remove oral biofilm. Numerous randomized controlled trials demonstrate its superior plaque reduction and gingival health improvements, including two times greater bleeding site reduction versus a manual control toothbrush and 59% greater bleeding site reduction versus sonic brushes.<sup>6-8</sup>

The Oral-B iO is also equipped with artificial intelligence technology and an engaging patient-connected app via Bluetooth\* that takes brushing guidance to another level. The brush provides real-time coaching to track brushing across all regions of the dentition to identify any tooth surfaces the brusher has missed. A recent analysis of 16.7 million brushing sessions showed that use of the app with live feedback resulted in a 94% average coverage, as well as longer brushing time and less overpressure compared to users who did not use live feedback.<sup>9</sup> It also has a smart pressure sensor with bimodal feedback; a green light shows that the patient is using the recommended pressure of 0.8 N to 2.5 N to successfully remove biofilm, and a red light indicates when the patient is brushing with too much pressure, >2.5 N.<sup>5</sup>

The combination of O-R technology plus micro-vibrations creates a quiet, smooth patient brushing experience.



FIGS 1 AND 2.

**Fig 1.** Oral-B iO toothbrush with Ultimate Clean brush head. **Fig 2.** Oral-B Targeted Clean brush head.



## Introduction

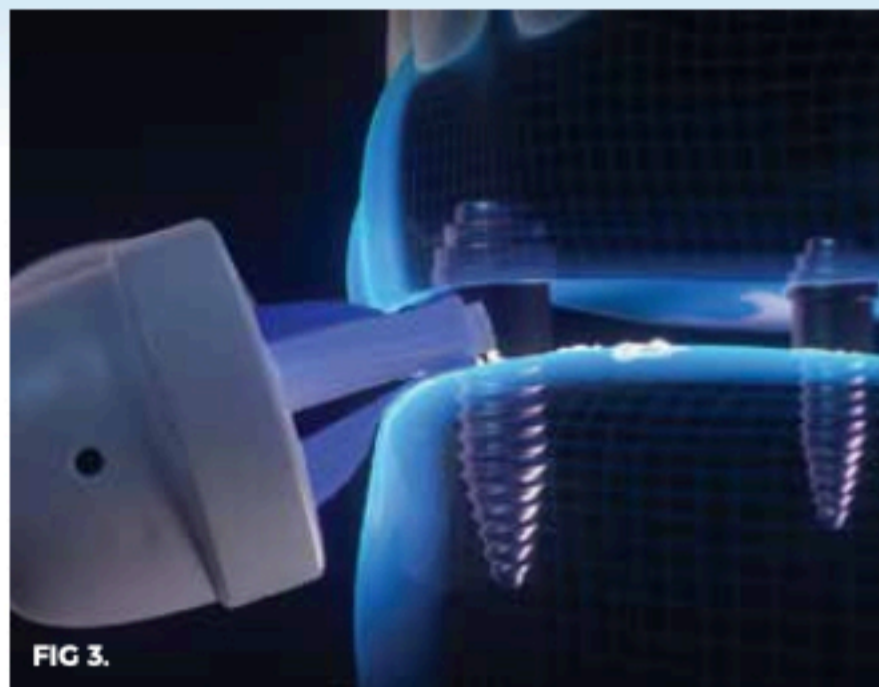


FIG 3.



FIG 4.

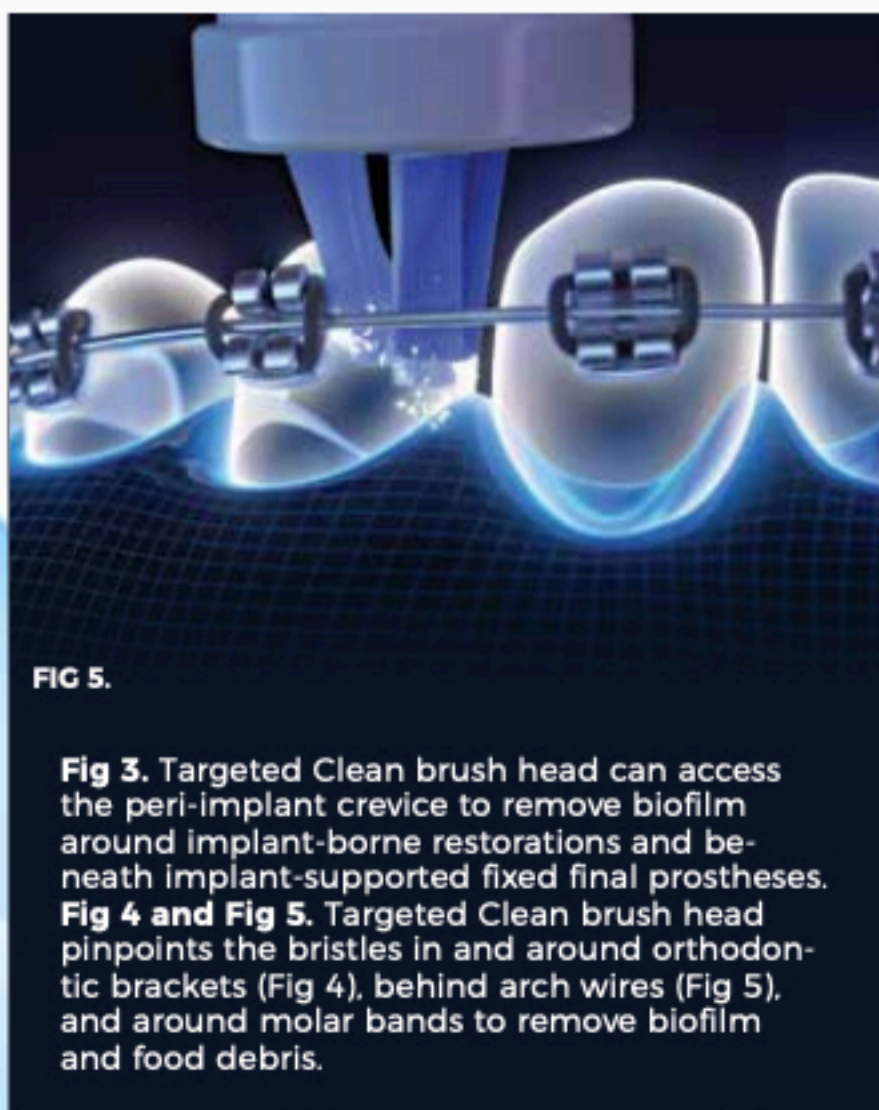


FIG 5.

**Fig 3.** Targeted Clean brush head can access the peri-implant crevice to remove biofilm around implant-borne restorations and beneath implant-supported fixed final prostheses. **Fig 4 and Fig 5.** Targeted Clean brush head pinpoints the bristles in and around orthodontic brackets (Fig 4), behind arch wires (Fig 5), and around molar bands to remove biofilm and food debris.

To personalize each patient's brushing experience, the Oral-B iO provides up to seven different brushing modes and specialized brush heads. The Daily Clean mode is designed for everyday brushing, and the Intense Clean mode provides enhanced cleaning results. The Sensitive and Super Sensitive modes allow for a perceptibly gentler experience for those users with sensitive mouths, patients in disease treatment, and patients who have just completed dental surgical procedures. The Tongue Cleaning mode completes a thorough brushing regimen.

The Oral-B iO specialized brush heads—Oral-B Ultimate Clean, Oral-B Gentle Care, and the novel Oral-B Targeted Clean™ (marketed as Specialised Clean in the European Union)—complete the specialized patient brushing experience. This supplement includes two case series reports utilizing the iO electric toothbrush with the Targeted Clean brush head for implant and orthodontic patients; the case series were conducted as part of a global practice-based assessment involving clinicians who specialize in periodontology and orthodontics.<sup>10,11</sup> An additional report of a randomized controlled trial evaluated gingival health benefits when the Oral-B iO was used with the Gentle Care brush head, utilizing the Sensitive mode.<sup>12</sup>

### Targeted Clean Brush Head: For Areas Requiring Special Focus

The new Targeted Clean brush head has a unique center tuft with longer bristles on the inside, surrounded by shorter, higher-density bristles to effectively access and clean hard-to-reach areas (Figure 2). This design is particularly useful for patients with misaligned teeth, teeth impacted by periodontal issues (eg, black triangles, recession), or impacted molars. It is also an excellent choice for patients with implants, including single implant-borne restorations, implant-supported removable overdentures, and implant-supported fixed final prostheses, as well as for patients with fixed or removable orthodontics such as clear aligner treatments.

#### Benefits for Implant Patients

The Oral-B Targeted Clean brush head is a highly effective oral hygiene tool for implant patients. The design is particularly useful because the brush head can access the peri-implant crevice, where the implant connects with the abutment, to remove biofilm around the gingival tissue of implant-borne restorations (Figure 3). This brush head can also target biofilm in and around the stud attachments of removable overdentures and under implant-supported fixed final prostheses.

In Dr. Thomas Lambert's case series report (p. 5), peri-implant mucositis patients used the Oral-B iO O-R electric toothbrush with the Targeted Clean brush head as part of an oral hygiene regimen.<sup>10</sup> After 6 weeks, patients had reduced inflammation, less bleeding on probing, and reduced plaque



scores, demonstrating markedly reduced peri-implant mucositis. This practice-based research illustrates the importance of a collaborative approach between dentist and hygienist to develop a personalized motivational home care regimen that can dramatically improve patient compliance.

### Benefits for Orthodontic Patients

For orthodontic patients, the Oral-B iO with the Targeted Clean brush head pinpoints the bristles in and around brackets, behind arch wires and hooks, and around molar bands to remove biofilm and food debris (Figure 4 and Figure 5). Clear orthodontic aligner patients can remove their aligners and use the Targeted Clean brush head to clean inside the aligner, along the gingival margins, and around composite attachments. Patients can utilize the iO brush with the Ultimate Clean or Gentle Care brush head to promote oral hygiene during orthodontic treatment. Good oral hygiene during orthodontic treatment helps patients avoid complications that can result in white-spot lesions, demineralization, and erythematous gingivae. These consequences of poor oral hygiene during orthodontic treatment can lead to longer treatment time and may require corrective treatments post-orthodontics, which can carry additional, unplanned costs to both the patient and the practice.

Dr. Dana van Elslande's case series (p. 12) shows that engaging and motivating young patients with fixed orthodontic appliances in their oral hygiene regimen is key to dramatically improving characteristic poor oral hygiene.<sup>11</sup> The cases show use of the Oral-B iO electric toothbrush with the Targeted Clean brush head increased brushing motivation, required less oversight by caregivers to ensure proper brushing, and reduced plaque in at-risk young orthodontic patients. These findings are particularly compelling, given that childhood gingivitis has been shown to reach a peak during puberty, which also coincides with the age when traditional orthodontic treatment begins.<sup>13</sup>

### Gentle Care Brush Head

The Gentle Care brush head, designed with a distinctive dense arrangement of filaments and an overall concave structure, adapts to the curvature of each tooth for gentle contact and cushioning for consistent biofilm removal (Figure 6). This brush head effectively removes biofilm while providing a gentle brushing experience, which may be preferred by many patients, especially those with sensitive gum tissue or existing soft-tissue

recession that may lead to experiencing hypersensitivity.

The randomized controlled trial reported by Grender et al (p. 17) evaluated the effects of using the Oral-B iO electric toothbrush with the Gentle Care brush head in Sensitive mode versus using a manual toothbrush for plaque and gingivitis reduction.<sup>12</sup> After 12 weeks, subjects in the Oral-B iO plus Gentle Care brush head group showed statistically significant gingival health improvements and plaque reductions compared to the manual control toothbrush. Furthermore, 92% of study participants using Oral-B iO plus Gentle Care transitioned from localized or generalized gingivitis ("not healthy") at baseline to periodontal health ("healthy") after 12 weeks compared to only 24% of subjects using the manual control toothbrush ( $P < .001$ ).<sup>12</sup>

These participants also had four times greater odds to transition from "not healthy" to "healthy" in as early as 1 week. Gingivitis scores and gingival bleeding sites were reduced by approximately three times more with use of the Oral-B iO plus Gentle Care versus the manual control toothbrush. The evidence-based research results show that, in combination, the specialized iO technology using the Sensitive mode, Gentle Care brush head, and Oral-B connected app can be used to dramatically improve the brushing experience for patients with sensitivity concerns.



FIG 6.

Fig 6. Oral-B Gentle Care brush head.

### Summary

Dental professionals should invest the time to personalize their patients' home care regimen. Collectively, the data in this supplement supports the benefits of personalizing the Oral-B iO brushing experience with multiple brushing modes, specialized brush heads to effectively disrupt biofilm, and the Oral-B app to motivate patients for improved compliance. Readers are encouraged to review the reports on the performance of Oral-B iO technology demonstrated in this peer-reviewed supplement, and then tailor your recommendations for oral hygiene aids to your patients' clinical needs and personal motivations to help them achieve improved oral and overall health.

### DISCLOSURE

The author is a member of the Oral-B Global Implant Advisory Board (Procter & Gamble).

### ABOUT THE AUTHOR

Susan Wingrove, BS, RDH

International speaker, researcher, instrument designer, and author of *Peri-Implant Therapy for the Dental Hygienist*, 2nd edition, Wiley, 2022



### REFERENCES

1. Kracher CM, Smith WS. Oral health maintenance dental implants. *Dent Assist*. 2010;79(2):27-35.
2. Scientific American. How poor oral health fosters systemic disease. Scientific American website. <https://www.scientificamerican.com/custom-media/healthy-mouth-healthy-body/how-poor-oral-health-fosters-systemic-disease/>. Accessed March 4, 2022.
3. Bidra AS, Daubert DM, Garcia LT, et al. Clinical practice guidelines for recall and maintenance of patients with tooth-borne and implant-borne dental restorations. *J Prosthodont*. 2016;25(suppl 1):S32-S40.
4. Grender J, Adam R, Zou Y. The effects of oscillating-rotating electric toothbrushes on plaque and gingival health: a meta-analysis. *Am J Dent*. 2020;33(1):3-11.
5. Adam R. Introducing the Oral-B iO electric toothbrush: next generation oscillating-rotating technology. *Int Dent J*. 2020;70(suppl 1):S1-S6.
6. Adam R, Goyal CR, Qaqish J, Grender J. Evaluation of an oscillating-rotating toothbrush with micro-vibrations versus a sonic toothbrush for the reduction of plaque and gingivitis: results from a randomized controlled trial. *Int Dent J*. 2020;70(suppl 1):S16-S21.
7. Grender J, Goyal CR, Qaqish J, Adam R. An 8-week randomized controlled trial comparing the effect of a novel oscillating-rotating toothbrush versus a manual toothbrush on plaque and gingivitis. *Int Dent J*. 2020;70(suppl 1):S7-S15.
8. Goyal CR, Adam R, Timm H, et al. A 6-month randomized controlled trial evaluating a novel smart-connected oscillating-rotating toothbrush versus a smart-connected sonic toothbrush for the reduction of plaque and gingivitis. *Am J Dent*. 2021;34(1):54-60.
9. Thurnay S, Adam R, Meyners M. A global, in-market evaluation of toothbrushing behaviour and self-assessed gingival bleeding with use of app data from an interactive electric toothbrush. *Oral Health Prev Dent*. 2022;20(1):1-10.
10. Lambert TJ. A home care regimen with Oral-B iO toothbrush and targeted clean brush head to reduce peri-implant mucositis. *Compend Contin Educ Dent*. 2022;43(suppl 1):5-11.
11. Van Elslande D. Use of an oscillating-rotating electric toothbrush and novel brush head to increase brushing motivation and reduce plaque among orthodontic patients. *Compend Contin Educ Dent*. 2022;43(suppl 1):12-16.
12. Grender J, Goyal CR, Qaqish J, et al. A 12-week randomized controlled trial comparing a novel electric toothbrush with an extra gentle brush head to a manual toothbrush for plaque and gingivitis reduction. *Compend Contin Educ Dent*. 2022;43(suppl 1):17-25.
13. Mombelli A, Gusberti FA, van Oosten MA, Lang NP. Gingival health and gingivitis development during puberty. A 4-year longitudinal study. *J Clin Periodontol*. 1989;16(7):451-456.