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Power Toothbrushes:

Technology Delivers Superior Clinical Results

By Wendy Bebey, RDH, BS

Orthodontic treatment unites the young, tweens, and adults. By that, I mean no matter the age of the patient, they are all now facing a change in how they must approach home care. Look at plaque scores of people not in orthodontic treatment, and it is fair to say that perfection is not the norm. Now, add the challenges of brackets and archwires and you have created an intraoral obstacle course. To help

navigate that obstacle course, patients will need a variety of products such as interdental brushes, orthodontic brushes, floss threaders/threader floss, antimicrobial toothpastes and rinses, etc.

Mechanical Plaque Control 101

The basis of good oral health is good oral hygiene. What if sound waves could clean teeth? Our home care instructions would include having a subwoofer installed in

your son's car so he can drive two miles per day with the volume turned to maximum. Wouldn't that make for ease of cleaning around orthodontics? Unfortunately, there is no magic sound wand to wave and we must be prepared to recommend proven methods to help our patients through these challenging times. Studies have revealed that biofilms are most effectively discouraged and removed by mechanical force.¹

Thus, the bristles of the toothbrush should touch the surface of the tooth and be engaged in the physical removal of the plaque biofilm.

Because of the importance of the mechanical plaque disruption, recommending the proper products is key. As a dental professional, you are well aware of the landscape of

Fig. 1



the oral care aisle. As a consumer, you know how overwhelming it can be. Help your patients navigate by arming them with specific product recommendations. Especially important is the recommendation of using a power toothbrush.

Brush heads specifically designed for orthodontic patients are available, including the Oral-B orthodontic brush head and Power Tip. (See Fig. 1) Another option is to make products available through your office. Orthodontic specialty products can be difficult to find on the shelf at retail outlets so consider purchasing products for resale through your office.

Myth or fact: Power toothbrushes are more effective than manual toothbrushes. If you answered fact, you are correct. To expand on that answer, a systematic review conducted by the Cochrane Oral Health Group found that “Brushes with a rotation oscillation action removed plaque and reduced gingivitis more effectively than manual toothbrushes in the short term, and reduced gingivitis scores in studies over three months. No other powered designs were as consistently superior to manual toothbrushes.”²

An evaluation of power toothbrushes conducted by an independent, non-profit dental education and product testing institute gave top honors to Oral-B.³ In the March 2010 issue of *Consumer Reports*, Oral-B was rated as the top power brush.⁴ Despite the proven capability of power over manual, still only 5% of households in the United States have a power brush. In comparison, 35% of households in Europe have a power brush. In my opinion, all households with a person in orthodontic treatment, as well as those not in orthodontic treatment, should have a power toothbrush.

The first mechanical toothbrush actually dates back to the 19th Century when clock spring mechanisms were used. The first mass production of power toothbrushes began in the 1960s when the designs mimicked the motion performed by a manual toothbrush and were recommended primarily for those with dexterity challenges.

“Brushes with a rotation oscillation action removed plaque and reduced gingivitis more effectively than manual toothbrushes in the short term, and reduced gingivitis scores in studies over 3 months.”

Over the years, the designs evolved to be much more efficacious. In 1990, the first oscillating-rotating brush by Oral-B was introduced. Inspired by design analogies to professional tools in the dental office, the small round brush head cups and surrounds the entire tooth. The turn around momentum of the oscillation causes high shearing forces and plaque is disrupted. In 1998, the patented 3D technology was introduced adding a pulsating movement. By combining these two distinct, but simultaneous motions, Oral-B created a breakthrough in technology for power brushes. And, most importantly, this technology has delivered superior clinical results.

Designs/Mechanics

Power toothbrushes operate from either electric rechargeable type batteries or replaceable (disposable) type batteries. There are various types of power brushes, categorized by the manner in which the brush-head moves. Types of brush head movements include: oscillating-rotating, side-to-side (sonic), counter oscillation, circular, and ultrasonic. Various brush head shapes are also



available for adults, children, and orthodontic patients as well as for interdental spaces. The brush shapes may be round, conical, or similar to traditional brush heads.

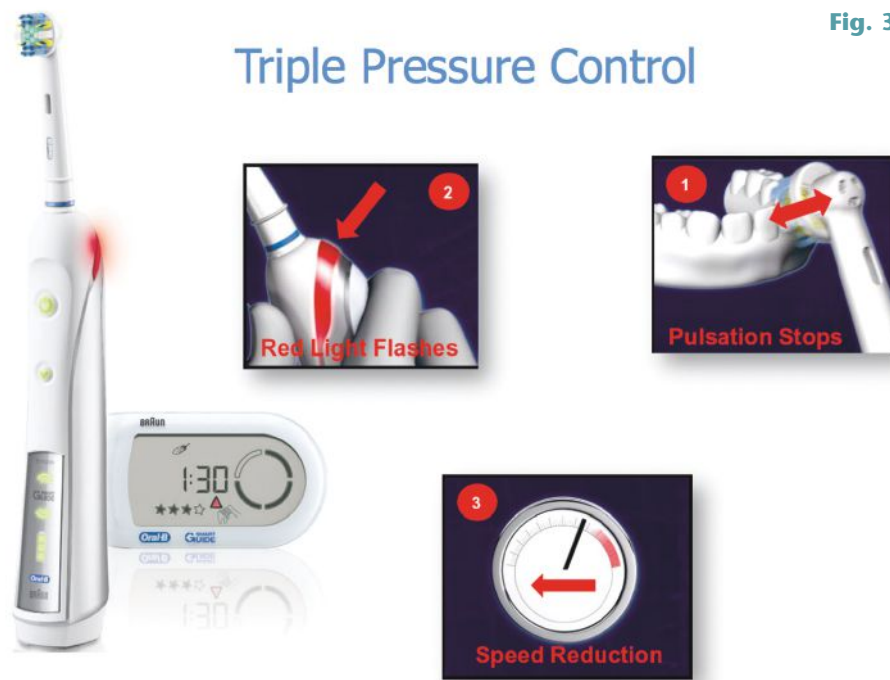
What Time is It?

Power toothbrushes with timers are improving patient compliance. The Oral-B Professional Care Smart Series 5000 brush features a wireless display (SmartGuide) that provides real time brushing feedback. (Fig. 2) The bonus is that the SmartGuide is a clock when you are not using the brush. Research has shown that in just thirty days,⁵ improved compliance included:

- ▶ Brushing longer. Patients were on average 5x more likely to brush the recommended 2 minutes twice per day.
- ▶ Brush with less pressure. 93% of patients reduced their excessive brushing force in 30 days.
- ▶ Brush more thoroughly. 92% of patients significantly improved their brushing thoroughness in 30 days.

Fig. 3

Triple Pressure Control



Triple control pressure system of Oral-B Professional Care SmartSeries 5000.

A Gentle Approach

"The harder I brush, the cleaner my teeth will be." Unfortunately, we know that is the mindset of a majority of our patients. The more obstacles to brush around, the increased chance of brushing with too much pressure. Using a brush with a pressure sensor feature to help coach patients to a gentler touch is a good recommendation. The Oral-B Professional Care Smart Series 5000 features a triple pressure control system. (Fig. 3) If you are brushing too hard:

- ▶ Pulsation stops (tactile signal) until the user brushes at a lower pressure.
- ▶ Red light flashes at the toothbrush handle neck (visual signal) to give a visual warning to the user.
- ▶ Reduction of speed (acoustic signal). The brush switches automatically to sensitive mode (lower speed 6,500 rotations/min vs. 8,800 rotations/min) every time the user presses too hard. If users continue to press too hard they will stay in the sensitive mode. When pressure is

reduced the brush will revert back to the previous mode.

- ▶ The SmartGuide will also display a red pressure light warning triangle and the pressure alert face will appear.

A systematic review by an independent group of researchers concluded that oscillating-rotating toothbrushes are as safe as manual toothbrushes.⁶ The in-vivo trials, encompassing nearly 2000 children and adult subjects in various clinical settings between 1993 and 2010, demonstrated that power toothbrushes do not pose a clinically relevant concern.

Chemical Plaque Control 101

Stannous fluoride has a long history of use in oral care products for protection against caries, plaque, gingivitis, hypersensitivity, and oral malodor. Over the past four decades, substantial research has proven stannous fluoride's benefits in these areas.⁷ In fact, stannous fluoride is the only fluoride clinically proven effective for caries, hypersensitivity and plaque/gingivitis. Recommending a toothpaste such as Crest Pro-Health with stabilized stannous fluoride and sodium hexametaphosphate,

an advanced agent to whiten extrinsic stains and inhibit calculus, can provide multiple benefits to your orthodontic patients.

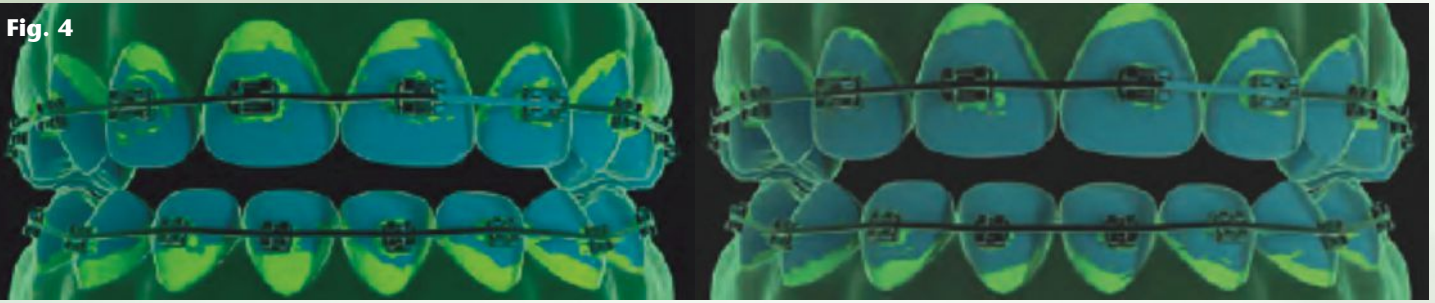
Plaque Control Utilizing A Novel Regimen

In 2007, an important study of a regimen consisting of an oscillating/rotating (O/R) power toothbrush combined with Crest Pro-Health paste and rinse was conducted.⁸ The design used Digital Plaque Imaging Analysis to measure overnight plaque accumulation and post-brushing plaque area on anterior surfaces of teeth after 2 and 4 weeks. A significant finding of this study is that after 4 weeks, the level of overnight plaque accumulation in the regimen group prior to brushing was 42% less than post-brushing plaque levels in the control group (manual brushing along with a sodium fluoride-containing paste). Since then, numerous studies have continued to confirm superiority of using the Pro-Health paste + Oral-B power brush + Pro - Health rinse regimen approach for maximum plaque control.

When the regimen approach was studied in orthodontic patients, once again, the results yielded a significant positive outcome. Karpinia et al, conducted a pilot study to evaluate use of a combined power brush, therapeutic dentifrice and rinse, plus floss on plaque accumulation and clinical gingivitis during orthodontic treatment.⁹ At baseline, subjects had a mean (SD) 75.9 (15.6) bleeding sites and 32% (20.3) plaque area coverage. After using the regimen for one month, mean (SD) bleeding was reduced by 30.8 (13.7) sites, while mean (SD) overnight plaque was reduced by 16.4% (17.9) area coverage, differing significantly ($p < 0.002$) from baseline for bleeding and plaque.

By following the complete dental routine, patients had a significant improvement in their oral health. Plaque images are compared from overnight plaque accumulation at baseline compared to one month. The results show 51% reduction in plaque (Fig. 4) and 41% reduction of gingival bleeding after 4 weeks.

Fig. 4



Overnight digital plaque images from subject in clinical trial at Baseline and Month 1.

OrthoEssentials

How many of you would like to see your patients have better compliance with the oral hygiene instructions you give them? The compliance tools developed as part of the Crest Oral-B OrthoEssentials kit visually keep everyone on the same page

and accountable to each other throughout treatment. The treatment bags include the patient tools:

- ▶ Visual grade sheet to monitor at home treatment
- ▶ Ortho treatment booklet that covers everything from instruc-

tions on how to brush and floss to making good food choices

- ▶ Take home report cards available to reinforce oral hygiene
- ▶ Fun stickers to personalize the patients brush handle
- ▶ Additional online tools that can be easily added to your practice

Find more information about the OrthoEssentials program by visiting Dentalcare.com.

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