ORAL-B POWER: THE SCIENTIFIC EVIDENCE
When a German engineer, in the late 1980s, invented the first electric toothbrush to feature a small round brush head and a unique oscillating-rotating movement, it was clear that, in order to obtain acceptance from the dental profession, a rigorous program of clinical testing would be required.

Since its introduction to the market in 1991, the Oral-B Power toothbrush has been the most independently researched and tested oral hygiene device ever produced.

World-renowned academic periodontists, in consultation with the German inventors, developed and oversaw the initial program of clinical testing. These first clinical trials looked at plaque-removal efficacy and the reversal of gingivitis. In addition, the safety of this novel brushing system was carefully evaluated. This first series of studies was published in peer-reviewed journals and showed this novel oscillating-rotating technology to be a highly effective brushing system. Not only was it superior to regular manual brushing for plaque and gingivitis control, but it was also gentle on the teeth and the oral soft tissues.

The initial clinical program included both long- and short-term studies involving both healthy and orally diseased subjects, at a time when the periodontal community was recommending electric toothbrushes only for the “handicapped.” Through this program, run in independent centers across Europe and North America and published in leading peer-reviewed journals, the profession was able to see the efficacy and safety of this device in improving and maintaining oral health for all patients. This led the American Academy of Periodontology to rewrite its guidelines to acknowledge the utility of an electric toothbrush for all patients.

Since these early days, Oral-B has continued to research and lead the published literature in the breadth and wealth of clinical studies on its oscillating-rotating technology. More studies have been published on this technology than on any other mechanical brushing device. In addition, a recently completed 3-year clinical trial represents the longest clinical investigation on power toothbrushes and confirmed, using repeat dental impressions and study models, the fact that gingival recession is neither caused by nor exacerbated by this device.
The efficacy, gentleness, and compliance of the oscillating-rotating technology have been extensively evaluated. Research has been conducted in a large cohort of subjects varying in age from 6 years to 80 years, and not only in healthy subjects but also in patients with existing periodontal problems, in patients undergoing orthodontic treatment, in patients with dental implants, and in those who have used a manual toothbrush overvigorously and, as a result, have existing areas of recession. In all subject groups, an improvement in oral health has been seen, with subjects tending to brush longer and more thoroughly than previously with a manual toothbrush. Patients prone to excessive force with a manual toothbrush tended inherently to brush with less force with this electric device. Study after study has shown that patients with existing gingival inflammation can reverse their gingivitis and safely maintain healthy gingival tissue.

With such a wealth of literature, a number of systematic reviews have been undertaken, with the prestigious and independent Cochrane Collaboration leading the field in publishing most of these reviews.

**The conclusions from these systematic reviews have confirmed the safety and superior efficacy of oscillating-rotating technology in both controlling plaque and reversing gingivitis when compared with manual toothbrushing and other power brushing technologies.**

The studies listed in this review represent the wealth of data accumulated over the last 20 years and show not only the efficacy and gentleness of the oscillating-rotating technology, but also the increased level of patient compliance when they switch to this power toothbrush. Optimal oral health is directly associated with optimal oral hygiene. The oscillating-rotating system has an unmatched level of published scientific evidence to allow dental professionals to unreservedly recommend this technology to all patients for improved efficacy and safety.

J. Leslie Winston, DDS, PhD
Director, Global Oral Care Professional & Clinical Operations
Clinical studies demonstrating efficacy

The primary purpose of a toothbrush is to disrupt and remove plaque. Since its development in the early 1990s, Oral-B Power has been rigorously assessed in clinical studies at independent research centers for plaque removal and reduction of gingivitis using the full range of clinical trial methodologies available.

More than 250 studies have been conducted to assess the efficacy of Oral-B toothbrushes. Throughout these evaluations, hard and soft tissues were monitored for safety and gentleness. Not only do the studies highlight the superior efficacy of Oral-B oscillating-rotating technology compared with a manual toothbrush, but they also confirm that, despite their speed of action, gentleness was never compromised.

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Oral-B Professional 5000 with FlossAction brush head maintained significantly lower levels of plaque than manual brushing combined with flossing

Comparison of the use of different modes of mechanical oral hygiene in prevention of plaque and gingivitis.


KEY CLINICAL RESULTS

- Oral-B Professional 5000 maintained significantly lower levels of plaque than manual brushing alone or manual brushing combined with floss at 10 weeks, 6 months, and 9 months (Figure 1).
- Oral-B Professional 5000 also showed significant gingival bleeding prevention benefits, maintaining significantly lower levels of bleeding compared to manual brushing alone at 10 weeks and at 6 months (Figure 2).

OBJECTIVE

To evaluate the effect of an oscillating/rotating/pulsating powered toothbrush on plaque and gingivitis prevention over a 9-month period.

STUDY DESIGN

- The study had an examiner blind, randomized 3-group parallel design. 120 subjects ≥18 yrs old were included, in general good health, at least 5 teeth per quadrant and no pockets ≥5 mm.
- A 3-week pretrial period of intensive oral home care was started to improve the level of gingival health. A thorough professional oral hygiene instruction with a manual brush was provided. Additionally subjects used Bocasan® (sodium perborate) mouthwash followed by Corsodyl® (chlorhexidine gluconate) mouthwash twice daily.
- At baseline, subjects were assigned to 1 of 3 oral hygiene regimens twice daily brushing with:
  1) oscillating/rotating toothbrush (Oral-B Professional 5000 with FlossAction brush head)
  2) manual toothbrush (ADA reference manual)
  3) manual toothbrush (ADA reference manual) in combination with the use of floss.

The same standard toothpaste was provided to all 3 regimens.

- Subjects were professionally instructed in their individually assigned regimen and were given a prophylaxis in order to start with equally clean teeth. Two weeks later an oral hygiene reinforcement was provided.
- Clinical parameters (gingival bleeding, plaque, staining, gingival abrasion) were assessed at pretrial, baseline, 10 weeks, 6 months, and 9 months.
Oral-B O-R electric toothbrush was found to be more effective than manual toothbrush at reducing plaque and gingivitis

A 3-month clinical investigation comparing the safety and efficacy of a novel electric toothbrush (Braun Oral-B® 3D Plaque Remover) with a manual toothbrush.


**CLINICAL COMMENT**
This three-month clinical study demonstrated that the Braun Oral-B® 3D Plaque Remover effectively controls plaque and reduces gingivitis. Compared to the manual control toothbrush, the 3D was found to be more effective at reducing plaque and gingivitis, particularly at interproximal sites. At these difficult-to-reach surfaces, the 3D progressively reduced plaque scores over the course of the study, and by day 90 had produced a two-times-greater reduction from baseline than the manual toothbrush, confirming the ability of the 3D to clean deeper. These results confirm the ability of the Braun Oral-B® 3D Plaque Remover, with its novel pulsating/oscillating/rotating action, to clean deeper than a manual toothbrush, particularly at hard-to-reach interproximal surfaces. The study also confirms that, over a three month period, the 3D is safe to use.

**OBJECTIVE**
The primary objective was to compare the efficacy of the Braun Oral-B® 3D Plaque Remover with a manual toothbrush, with respect to control of plaque and gingivitis. A secondary objective was to evaluate safety over a 3-month period of use.

**DESIGN**
Randomized, parallel group, single-blind to the examiner.

**MATERIALS AND METHODS**
A total of one-hundred and fourteen healthy adult volunteers from a general population were entered into this 3-month study. They were between 18 and 65 years of age, had at least 18 natural teeth, and had no evidence of extensive caries or periodontal disease. To enter the study, volunteers had to have a whole mouth plaque score of ≥2.0 (Turesky modification of Quigley-Hein).

At baseline, volunteers were examined for evidence of preexisting soft and hard tissue abrasion, and were scored for plaque (Turesky modification of Quigley-Hein), gingivitis (Löe and Silness), and gingival bleeding (derived from Löe and Silness gingival index). They were then allocated either the Braun Oral-B® 3D or an ADA-approved manual toothbrush, supplied with Colgate® regular toothpaste and instructions in the use of their respective brushes, and asked to brush twice daily for two minutes.

Plaque, gingivitis, and gingival bleeding was reassessed by one examiner who was unaware of the type of brush used by the subject, at day 14, at day 35, and at the end of the study (day 90). At each examination over the three months of the study, volunteers were assessed for evidence of hard tissue and gingival abrasion.

Colgate® is a registered trademark of Colgate-Palmolive Company.
RESULTS
Both the 3D and the manual toothbrush were found to be safe, with no clinical evidence of significant hard or soft tissue abrasion at any time point in the study.

The whole mouth plaque index, gingival index, and bleeding index were all significantly reduced from baseline at all time periods in both groups (p<0.005), except for day 35 in the manual group, when the plaque index was not significantly reduced from baseline. In terms of a percentage reduction from baseline at day 90, the 3D reduced plaque by 15%, gingivitis by 16%, and bleeding by 65%. Figures for the manual toothbrush were 8%, 13%, and 58%, respectively. The 3D was significantly more effective than the manual toothbrush with respect to plaque reduction at day 14, day 35, and day 90, and gingivitis at day 90 (p<0.05).

Analysis of data from individual sites within the mouth revealed that for plaque, the 3D was significantly more effective than the manual brush at interproximal sites and anterior lingual sites, at all 3 time periods (p<0.05). Interproximal plaque scores decreased by 15% at day 90 in the 3D group, in contrast to 7% in the manual toothbrush group. A significant advantage in favor of the 3D was also observed for the gingival index at posterior lingual sites at day 90 (p<0.05).
An Eight-Week Clinical Evaluation of an Oscillating-Rotating Power Toothbrush with a Brush Head Utilizing Angled Bristles compared with a Sonic Toothbrush in the Reduction of Gingivitis and Plaque


KEY CLINICAL FINDINGS

- Statistically significant reductions in plaque and gingivitis ($P<0.001$) were demonstrated by both the oscillating-rotating Oral-B® Professional Care 1000 brush with Oral-B® CrossAction brush head (O-R) and the Sonicare DiamondClean toothbrush (sonic) over the 8-week study period.
- The O-R brush was statistically significantly more effective in reducing plaque and gingivitis than the sonic brush ($P<0.001$ for all six measures). See Figures 1 and 2.
- No adverse events were observed for either brush.

OBJECTIVE

To evaluate an O-R power toothbrush with a brush head utilizing angled bristles to a marketed sonic toothbrush in the reduction of plaque and gingivitis over 8 weeks.

METHODS

- This was a randomized, examiner-blind, single-center, two-treatment, parallel group eight-week clinical trial.
- Generally healthy adults with mild-to-moderate plaque and gingivitis were assessed for baseline whole mouth, gingival margin and approximal plaque, gingivitis, and gingival bleeding using the Rustogi Modified Navy Plaque Index, Modified Gingival Index, and Gingival Bleeding Index.
- Subjects were randomized to one of two treatment groups:
  1) The O-R brush [Oral-B® Professional Care 1000 (D16u) with Oral-B® CrossAction brush head (EB50), Procter & Gamble]; or
  2) Sonic brush (Sonicare® DiamondClean with the standard DiamondClean brush head, Philips).
- Subjects brushed twice a day, for 2 minutes per brushing, with their assigned toothbrush and a standard fluoride dentifrice for 8 weeks. Plaque and gingivitis were reassessed at Week 8 using the same methods. Participants abstained from oral hygiene for 12 hours prior to baseline and Week 8 clinical measurements.
CLINICAL COMMENT
Numerous randomized clinical trials have shown significant advantages for O-R power toothbrushes versus sonic toothbrushes in the reduction of plaque and gingivitis. In fact, a systematic review including 17 published trials and 1369 subjects found O-R brushes reduced plaque and gingivitis more than those with a side to side (sonic) action in the short term (4 to 12 weeks). The majority of studies have compared comparable models, for example evaluating a premium O-R handle to a premium sonic handle. This study compared a mid-range O-R handle to a premium sonic handle. Collectively the literature and results from this trial show that not only does a premium O-R toothbrush provide greater gingivitis and plaque reductions versus a premium sonic model, but a mid-range O-R model provides significantly greater benefits as well.

**Oral-B Professional 5000 with FlossAction brush head demonstrated significantly greater reduction of MGI, bleeding sites, and plaque vs Sonicare DiamondClean Sonic toothbrush**

12-week clinical evaluation of Oral-B Professional 5000 with FlossAction brush head versus Sonicare® DiamondClean™ in reducing gingivitis and plaque


**KEY CLINICAL RESULTS**

- **Modified Gingival Index (MGI):** The Oral-B Professional 5000 (oscillating-rotating, O-R) power toothbrush demonstrated a 31.9% greater reduction in MGI scores from baseline at week 6 and a 32.3% greater reduction at week 12 relative to the Sonicare® DiamondClean™ (sonic) toothbrush (P<0.001). See Figure 1.

- **Number of bleeding sites:** The O-R brush demonstrated a 43.4% greater reduction in number of bleeding sites from Baseline at week 6 and a 34.9% greater reduction at week 12 versus the sonic brush (P<0.001). See Figure 2.

- **Plaque:** The O-R brush demonstrated a 15.8% greater whole mouth plaque reduction from baseline at week 6 and a 19.3% greater reduction at week 12 versus the sonic brush (P<0.05). Similarly, for plaque along the gumline, the O-R brush showed a 24.1% greater reduction from baseline at Week 6 and a 30.4% greater reduction at week 12 (P<0.001 Week 12). The O-R brush also showed advantages in reducing interproximal plaque, with a 22.9% greater reduction from baseline at week 6 and a 24.4% greater reduction at week 12 (P<0.05).

- **Safety:** Both brushes were well tolerated.

**OBJECTIVE**

To evaluate the efficacy of an advanced oscillating-rotating power toothbrush (Oral-B Professional 5000 with FlossAction brush head) relative to a new sonic power toothbrush (Sonicare DiamondClean) in the reduction of gingivitis and plaque over 12 weeks.

**STUDY DESIGN**

- This was a single-center, open-label, examiner-blind, 2-treatment, parallel group, randomized study in which subjects brushed with their assigned toothbrush and a marketed dentifrice for 2 minutes twice daily at home for 12 weeks. See Figure 3.

- Gingivitis and plaque were evaluated at baseline, week 6, and week 12 using the Modified Gingival Index (MGI), Number of Bleeding Sites, and Rustogi et al Modification of the Navy Plaque Index (RMNPI). Safety was also assessed at every visit.

Sonicare is a registered trademark of Koninklijke Philips N.V.
Figure 1 – Change in MGI Score vs Baseline

Figure 2 – Change in # of bleeding sites vs Baseline

Figure 3 – Study design

N=130 subjects.
A 12-Week Clinical Comparison of the Safety and Efficacy of Two Power Toothbrushes in the Reduction of Plaque and Gingivitis

A randomized 12-week study to compare the gingivitis and plaque reduction benefits of a rotation-oscillation power toothbrush and a sonic power toothbrush.


OBJECTIVE
To evaluate and compare the safety and efficacy of 2 toothbrushes in the reduction of gingivitis and plaque over a 12-week period.

STUDY DESIGN
• 175 subjects were randomized to treatment. 173 subjects were evaluable for week 6 analyses and 171 for week 12 analyses.
• This was a single-center, examiner-blind, 12-week, 2-treatment, open label, parallel group, randomized study. 177 subjects with evidence of gingivitis were enrolled.
• Plaque and gingivitis measurements were taken at three (3) timepoints: baseline, week 6, and week 12. Plaque measurements were also taken pre- and postbrushing at each visit. Treatments were evaluated using the Rustogi Modification of the Navy Plaque Index (RMNPI), the Modified Gingival Index (MGI) and the Gingival Bleeding Index (GBI).
• At baseline, qualified subjects were stratified and randomly assigned to one of the 2 treatment groups based on baseline prebrushing plaque and gingivitis scores, gender, and smoking:
  - Oral-B Professional 5000 with FlossAction brush head with oscillating-rotating technology (Procter & Gamble) or
  - Sonicare FlexCare with sonic technology (Philips)
• Subjects then received oral hygiene instructions and product usage instructions. They brushed according to the manufacturer’s toothbrush instructions with their assigned toothbrush. Following subjects’ brushing, the examiner carried out a postbrushing plaque exam.
• Subjects were instructed to brush with their assigned toothbrush and dentifrice for two minutes twice daily at home according to the written and verbal usage instructions given to them during product distribution. Subjects were reminded to refrain from brushing their teeth for 12 hours and refrain from eating, chewing gum, drinking, smoking for four (4) hours prior to their next visit.
• Subjects returned for gingivitis and pre- and postbrushing plaque measures at 6 and 12 weeks following the baseline visit.

Sonicare is a registered trademark of Koninklijke Philips N.V.
Gingivitis and plaque reduction of an oscillating-rotating power brush with novel angled bristle tufts vs Colgate ProClinical Sonic toothbrush

A randomized clinical trial evaluating gingivitis and plaque reduction of an oscillating-rotating power brush with a new brush head with angled bristles versus a marketed sonic brush with self-adjusting technology


KEY CLINICAL RESULTS

- The oscillating-rotating (O-R) brush with novel angled bristle tufts (Oral-B® Pro 5000 with the Oral-B® CrossAction® brush head) demonstrated statistically significantly greater reductions (p<0.05) in all gingivitis measures as well as whole mouth and interproximal plaque measures compared with the sonic toothbrush (Colgate® ProClinical® A1500 with Triple Clean brush head).

- The benefit for the O-R brush over the sonic brush were 21.3% for gingivitis, 35.7% for gingival bleeding, 34.7% for number of bleeding sites, 17.4% for whole mouth plaque, and 21.2% for interproximal plaque. See Figures 1-4.

- Both brushes produced statistically significant reductions in gingivitis and plaque measures relative to baseline after 6 weeks (p<0.001 for all).

- There were no adverse events reported or observed for either brush.

OBJECTIVE

To compare the efficacy of an oscillating-rotating power toothbrush with a novel angled brush head with CrissCross® bristles versus a marketed sonic toothbrush in the reduction of gingivitis and plaque over a 6-week period.

STUDY DESIGN

- This was a single center, randomized, open label, examiner blind, 2-treatment, parallel group study involving 65 subjects per group. See Figure 5.

- To qualify for the study, subjects were required to have a baseline plaque score >0.5 and an MGI score ≥ 1.75 and <2.3.

- Subjects were randomized to 1 of 2 brush treatments: Oral-B Pro 5000 with the Oral-B CrossAction brush head (D34/EB50) or the Colgate ProClinical A1500 sonic brush with the Triple Clean brush head. Subjects used each brush according to the manufacturer’s instructions twice a day for 2 minutes per brushing for 6 weeks.

- Clinical evaluations were done at baseline and Week 6. Gingivitis was assessed using the Modified Gingival Index and Gingival Bleeding Index. Plaque was assessed using the Rustogi Modified Navy Plaque Index. No oral hygiene was permitted 12 hours prior to each visit.

- Data was analyzed using the analysis of covariance (ANCOVA) with baseline as the covariate.

Colgate ProClinical is a registered trademark of Colgate-Palmolive Company.
**Figure 1. Reduction in Gingivitis**

Adjusted Mean Reduction

21.3% difference

**Figure 2. Reduction in Number of Bleeding Sites**

Adjusted Mean Reduction

34.7% difference

**Figure 3. Reduction in Whole Mouth Plaque**

Adjusted Mean Reduction

17.4% difference

**Figure 4. Reduction in Interproximal Plaque**

Adjusted Mean Reduction

21.2% difference

**Figure 5. Study Design**

N=65/group

Week 6

Baseline

Oral-B Pro 5000 with Cross Action brush head

Colgate ProClinical A1500 with Triple Clean brush head
Oral-B PRO 5000 with CrossAction brush head demonstrated significantly greater reductions in all gingivitis and plaque measures compared with Sonicare DiamondClean

A 6-week clinical evaluation of the plaque and gingivitis efficacy of an oscillating-rotating power toothbrush with a novel brush head utilizing angled CrissCross bristles versus a sonic toothbrush


KEY CLINICAL RESULTS

- The oscillating-rotating (O-R) brush with the novel brush head, Oral-B® Pro 5000 with Oral-B CrossAction® brush head and SmartGuide®, demonstrated statistically significantly greater reductions in all gingivitis and plaque measures compared with the sonic toothbrush Sonicare® DiamondClean®. The benefits for the O-R brush over the sonic brush were 32.6% for gingivitis (Figure 1), 35.4% for gingival bleeding, 32% for number of bleeding sites (Figure 2), 22% for whole mouth plaque, 24.2% for gingival margin plaque, and 33.3% for interproximal plaque (Figure 3). \( p \leq 0.001 \) for all measures except gingival margin plaque, where \( p = 0.018 \).

- Both brushes produced statistically significant reductions in gingivitis and plaque measures relative to baseline (\( p < 0.001 \) for all).

OBJECTIVE

To compare the efficacy of an oscillating-rotating power toothbrush with a novel brush head (Oral-B Pro 5000 with Oral-B CrossAction brush head) versus a sonic toothbrush (Sonicare DiamondClean) for plaque and gingivitis reduction over a 6-week period.

STUDY DESIGN

- This was a randomized, 2-treatment, parallel group study involving 65 subjects per group.

- To qualify for the study, subjects were required to have a baseline plaque score greater than 0.5 and a gingivitis score greater than or equal to 1.75 and less than 2.3.

- Clinical evaluations were done at baseline and Week 6. Gingivitis was assessed using the Modified Gingival Index and Gingival Bleeding Index. Plaque was assessed using the Rustogi Modified Navy Plaque Index. No oral hygiene was permitted for 12 hours prior to each visit.

- Subjects were randomized to 1 of 2 brush treatments: Oral-B Pro 5000 with the Oral-B CrossAction brush head (D34/EB50) or the Sonicare DiamondClean brush with the standard brush head. Subjects used each brush according to the manufacturer's instructions twice a day for 6 weeks.

- Data were analyzed using analysis of covariance with baseline as covariate.

Sonicare DiamondClean is a registered trademark of Koninklijke Philips N.V.
**Figure 1. Reduction in Gingivitis**

Adjusted Mean Reduction

- O-R
- Sonic

*32.6% difference*

**Figure 2. Reduction in Number of Bleeding Sites**

Adjusted Mean Reduction

- O-R
- Sonic

*32% difference*

**Figure 3. Reduction in Interproximal Plaque**

Adjusted Mean Reduction

- O-R
- Sonic

*33.3% difference*

**Figure 4. Study Design**

- N=65/group
- Week 6
- Baseline
- Oral-B Pro 5000 with CrossAction brush head
- Sonicare DiamondClean
Oral-B PRO 1000 with CrossAction brush head removed more than twice as much whole mouth and interproximal plaque versus a manual toothbrush

Plaque reduction efficacy of an oscillating-rotating power brush with a novel brush head utilizing angled bristle tufts


KEY CLINICAL RESULTS
• The oscillating-rotating brush (O-R), Oral-B® Pro 1000 with the Oral-B® CrossAction® brush head, demonstrated greater than 2x whole mouth and interproximal plaque reduction versus a flat-trimmed manual toothbrush after 6 weeks of brushing.
  • Whole mouth: Baseline whole mouth plaque was 2.822 for the O-R brush and 2.809 for the manual brush. Adjusted mean plaque reductions were 0.656 for the O-R brush and 0.248 for the manual toothbrush. The difference between brushes was 164.5% (p<0.001). See Figure 1
  • Interproximal: Baseline interproximal plaque was 3.083 for the O-R brush and 3.041 for the manual brush. Adjusted mean plaque reductions were 0.639 for the O-R brush and 0.239 for the manual toothbrush. The difference between brushes was 167.4% (p<0.001). See Figure 2
• Mean plaque reductions were statistically significantly different from baseline for both the O-R and manual toothbrushes (p<0.001).

OBJECTIVE
To compare the efficacy of a marketed O-R power toothbrush with a novel brush head utilizing angled bristle tufts to a standard manual toothbrush control in the reduction of whole mouth and interproximal plaque over a 6-week period.

STUDY DESIGN
• This was a 6-week, randomized, single-center, examiner-blind, 2-treatment (n=60/treatment), open-label, parallel-group study.
• To qualify for the study, subjects were required to have a baseline whole mouth mean plaque score of ≥1.75 using the Turesky Modified Quigley-Hein Plaque Index (TMQHPI) and be a previously screened consistent manual toothbrush user.
• Clinical plaque evaluations and oral soft tissue examinations were done at baseline and Week 6. No oral hygiene was permitted 12 hours prior to each visit. Eating, chewing gum, drinking, and using tobacco were not permitted within 4 hours of the visit.
• Subjects were stratified based on gender, baseline whole mouth TMQHPI score and age, and randomized to 1 of 2 treatments: Oral-B O-R rechargeable power toothbrush (D16U) with the Oral-B CrossAction (EB50) brush head or the ADA reference, manual, soft toothbrush. Subjects used their assigned brush twice a day for 6 weeks. Subjects in the O-R group used the brush according to manufacturer’s instructions (2 minutes per brushing). Subjects in the manual group used the toothbrush as they normally do.
• Data were analyzed using an ANCOVA with baseline whole mouth plaque scores as the covariate.
Figure 1. Reduction in Whole Mouth Plaque at Week 6

Adjusted Mean Reduction 164.5%

Figure 2. Reduction in Interproximal Plaque at Week 6

Adjusted Mean Reduction 167.4%
Clinical studies demonstrating gentleness

It was recognized in the 1950s that many poorly designed manual toothbrushes with hard, unpolished filaments caused gingival abrasions and traumatized the tissues, leading to bleeding, inflammation, and possible recession. The Oral-B oscillating-rotating electric toothbrush with end-rounded filaments has been studied extensively—in more than 35 clinical trials—for its effect on gingival health. Clinical trials assessing safety as an end point are even more numerous, with more than 100 trials involving 5600 subjects representing 44,743 patient-weeks of use.

The trials described in this section exemplify the wealth of data demonstrating a positive effect on gingival condition, both in the short term and, most importantly, in the long term. Gingival inflammation can also be used as a surrogate variable for assessing safety and gentleness. The studies show that the brush can not only successfully and rapidly reverse gingival inflammation but can also maintain a healthy gingival condition over the long term.

CONTENTS: GENTLENESS CLINICAL SUMMARIES

- O-R electric toothbrushes do not pose a concern to hard or soft tissues 22
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O-R electric toothbrushes do not pose a concern to hard or soft tissues

Safety of oscillating-rotating powered brushes compared to manual toothbrushes: a systematic review.

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KEY CLINICAL FINDINGS
A large number of published studies in the past 2 decades consistently shows oscillating-rotating toothbrushes to be safe relative to manual toothbrushes, demonstrating that oscillating-rotating power toothbrushes do not pose a clinically relevant concern to hard or soft tissues.

OBJECTIVE
Power toothbrushes with oscillating-rotating action have been proven clinically effective, but a comprehensive review of clinical and laboratory investigations solely comparing the safety of oscillating-rotating power toothbrushes with manual toothbrushes has not been published. The goal of this systematic review was to examine the literature concerning the relative soft and/or hard tissue safety outcomes with the use of oscillating-rotating toothbrushes versus manual toothbrushes.

METHODS
A search of in vivo and in vitro trials through May 2010 was conducted using the electronic databases of the National Library of Medicine (PubMed-MEDLINE), the Cochrane Central Register of Controlled Trials (Cochrane-CENTRAL), and the Excerpta Medical Database (EMBASE) to identify appropriate studies that evaluated the effects of an oscillating-rotating power toothbrush compared with a manual toothbrush for soft and/or hard tissue safety. Eligible trials incorporated a safety evaluation as a primary or secondary outcome parameter (ie, gingival recession, observed/reported adverse events, and hard tissue effects) or used a surrogate parameter (ie, stained gingival abrasion and brushing force) to assess safety. Data extraction for the primary- and surrogate-measure safety studies, which included mean values and SDs when available, and a meta-analysis of the gingival recession data were performed.

RESULTS
Independent screening of the titles and abstracts of 697 PubMed-MEDLINE, 436 Cochrane-CENTRAL, and 664 EMBASE papers resulted in 35 publications meeting eligibility criteria. The mean change in gingival recession was not significantly different among toothbrush groups in the 2 selected trials with safety as a primary outcome (weighted mean difference: 0.03). It was not possible to do a meta-analysis of the 5 trials that evaluated safety with a surrogate parameter; however, there were no significant between-group differences at the study end in any trial. A descriptive analysis of the 24 selected studies assessing safety as a secondary outcome showed few brushing-related adverse events. The heterogeneity in objectives and methodology of the 4 in vitro trials that met the eligibility criteria precluded generalization of the results.

Paper Selection Process

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To read commentary on this publication, see Summary Review by Peter G. Robinson in Evidenced-Based Dentistry (2011) 12, 69.
Cervical dental abrasion with O-R electric toothbrush not higher vs manual

Tooth abrasion by manual and oscillating-rotating power toothbrushes.


KEY CLINICAL RESULTS

- The manual toothbrush and oscillating-rotating power toothbrush were not found statistically significantly different at any time point for depth of cervical dental abrasion.
- Maximum depth of cervical dental abrasion at 6, 12, 18, and 35 months was 33.1 [28.0]µm, 51.9[44.4]µm, 72.2[47.0]µm, and 95.0[35.5]µm, respectively, for the oscillating-rotating power toothbrush group (p<0.001 versus baseline for all time points) (Fig. 1)
- Cervical dental abrasion for the same time points was 38.5[30.2]µm, 54.8[39.4]µm, 71.6[26.5]µm and 97.8[51.9]µm for the manual toothbrush group (p<0.001 versus baseline for all time points) (Fig. 1)

OBJECTIVE

To assess dental abrasion following use of either an oscillating-rotating-pulsating power toothbrush or an ADA-reference manual toothbrush over a period of 35 months.

STUDY DESIGN

- This was a prospective randomized, controlled, single-blind, parallel study design with subjects having at least 2 recessions of at least 2 mm
- Subjects were randomized to receive the oscillating-rotating power toothbrush (Oral-B D17U, n=55) or a standard manual toothbrush (n=54)
- Subjects were instructed to brush with the assigned toothbrush and a standard fluoride toothpaste for 2 minutes, twice daily
- Full-mouth impressions were taken at 6, 12, 18, and 35 months and models poured in super-hard white dental plaster within 1 day of the impressions being taken
- A 3D-Laserscan Profiler was used on each set of models to record the 3-dimensional profiles of the cervical areas of the teeth
- Dental abrasion was measured at recession sites by digitally subtracting the differences in the 3-dimensional cervical areas on the models at each time point

Figure 1. Maximum dental abrasion (in µm) over a period of 35 months
3-Year Randomized Study of Manual and Power Toothbrush Effects on Pre-existing Gingival Recession


CONCLUSION
Subjects with pre-existing gingival recession showed no adverse effects on recession after three years of brushing with either an oscillating-rotating power or manual toothbrush.

KEY CLINICAL RESULTS
- Mean gingival recession for sites with initial recession did not worsen in either group or differ significantly between the power and manual toothbrush groups after approximately 3 years. See Figure.
- Examination of the oral cavity at each assessment visit revealed no adverse effects on hard or soft tissues in either group.

OBJECTIVE
This was a controlled, parallel group, randomized clinical trial to compare the effects of brushing with an oscillating-rotating power toothbrush or an ADA reference manual toothbrush on pre-existing gingival recession over approximately a 3-year period.
**STUDY DESIGN**

- Healthy subjects with pre-existing recession (≥2mm) were randomized into one of two groups:
  - An oscillating-rotating power toothbrush (D17U, Oral-B ProfessionalCare®, Procter & Gamble, Cincinnati, OH, USA, n=55) or
  - An ADA reference manual toothbrush (Chicago, IL, USA, n=54).
- Subjects brushed their teeth twice daily, for 2 minutes per brushing, with their assigned toothbrush and a standard sodium fluoride toothpaste.
- At Baseline, Month 12, Month 18 and Month 35, the same examiner assessed subjects for clinical attachment loss and probing pocket depths at six sites per tooth. Gingival recession was calculated at pre-existing sites as the difference between clinical attachment loss and probing pocket depths. Safety was assessed by hard and soft oral tissue examinations.

**CLINICAL COMMENT**

There have been some hypotheses that the use of power toothbrushes is associated with gingival recession. A 2011 systematic review of 35 studies found that oscillating-rotating toothbrushes are safe compared to manual toothbrushes, and they pose no clinically relevant concern to hard or soft and hard tissues. This 3-year randomized clinical trial corroborates and reinforces those findings, showing that daily brushing with either a power or a manual toothbrush does not adversely affect gingival recession. Thus, based on the results of this trial and other published reviews, oral health professionals can recommend oscillating-rotating toothbrushes with the assurance that their patients will enjoy a highly effective, safe, and gentle clean.

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Immunization of periodontal indices with implant patients

A clinical study on the safety and acceptability of an oscillating-rotating power toothbrush on the maintenance of peri-implant mucosal health in implant patients.


KEY CLINICAL RESULTS
There was an improvement of all three selected periodontal indices over time (see Table):
• Crown Length (CL): average decrease 0.2 mm
• Mean Probing Depth (MPD): average decrease 0.3 mm
• Bleeding Score (BS): average decrease 0.85

The decrease of CL, MPD and presence of bleeding was evident at 3 months and persisted thereafter.

Bleeding severity declined gradually over the whole period.

CL decreased only among females (61% of subjects); investigators are unsure of the reason for this finding.

Patients reported high comfort and satisfaction using the oscillating-rotating power brush. 94% of patients (92 of 98) said they would continue to use the brush after the trial.

OBJECTIVE
To assess the safety and acceptability of the oscillating-rotating power toothbrush on abutments and peri-implant soft tissues.

Table. Key Periodontal Indices Per Visit

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>3 months</th>
<th>6 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CL (mm)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>11.9</td>
<td>11.7</td>
<td>11.7*</td>
<td>11.7</td>
</tr>
<tr>
<td>Median</td>
<td>12</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td><strong>MPD (mm)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.8</td>
<td>3.5**</td>
<td>3.6**</td>
<td>3.5**</td>
</tr>
<tr>
<td>Median</td>
<td>3.75</td>
<td>3.5</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>BS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.5</td>
<td>0.96**</td>
<td>0.85**</td>
<td>0.65**</td>
</tr>
<tr>
<td>Median</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

N=98
*Significantly different vs baseline (p<0.05); student’s t-test.
**Significantly different vs baseline (p<0.001); student’s t-test.
STUDY DESIGN

- This was a 12-month, open, prospective, randomized, examiner-blinded study with subjects rehabilitated with endosseous dental implants in esthetic areas in the upper jaw between tooth #14 and tooth #24.

- 100 subjects meeting enrollment criteria were given an Oral-B 3D Excel upgrade for the study period to use twice daily with toothpaste for 2 minutes per brushing during the trial. They received detailed instructions on how to use the brush. Subjects also received instruction on the use of interdental brushes or toothpicks. The use of interdental products was recorded for each subject. Brush heads were replaced every 3 months.

- At baseline, subjects had their medical history recorded and were evaluated at baseline and months 3, 6, and 12 for the following parameters:
  1) Crown length in mm.
  2) Mean probing depth in mm, calculated as the average of the 4 probing depths.
  3) Bleeding score, calculated as the sum of bleeding sites of probing, with values ranging from 0 to 4.

Subjects also received a questionnaire regarding the acceptability of the brush and were asked if they would keep using the power toothbrush at the end of the trial.
KEY CLINICAL RESULTS
• After 30 days of at-home use, subjects using Oral-B Professional 5000 with FlossAction brush head decreased the average time the pressure sensor was activated by 22.1 seconds, representing an 88.5% decrease from baseline.
  - Subjects in the Oral-B Professional 5000 group had an average decrease of 10.1 seconds, representing a 53.4% decrease from baseline.
  - The decrease in pressure sensor activation time for the Oral-B Professional 5000 group was statistically significantly greater than the decrease in time for the Professional 5000 group ($p=0.034$).
• In the Oral-B Professional 5000 group, 93.1% of subjects (27 of 29) had a decrease in the average time the pressure sensor was activated from baseline to the final visit compared with 72.4% of subjects (21 of 29) in the Professional 5000 group. The fraction of subjects with a decrease in time from baseline to the final visit was higher for the Professional 5000 with SmartGuide group ($p=0.039$, 1-tailed test).
• Both products were well tolerated.

OBJECTIVE
To determine if subjects who exert high pressure against their teeth when using a powered toothbrush continued to exert high pressure following 30 days of using an Oral-B Professional 5000 toothbrush with Smart Guide, a wireless display with a visual pressure sensor.

Toothbrushes were:
• Oral-B Professional 5000 with SmartGuide wireless display
• Oral-B Professional 5000 without SmartGuide wireless display (control)

STUDY DESIGN
• This study used a 2-treatment, randomized, parallel group, 30-day design. Subjects were generally healthy adults with at least 20 teeth who self-reported regular visits to the dentist and gave informed consent.
• A screening visit was held to identify subjects who exerted high pressure against their teeth while brushing. This was defined as activating the visual pressure sensor for at least 4 seconds during a 2-minute brushing. The sensor activation time was determined by trained site personnel based on video recordings of the wireless display taken during brushing. The display could not be viewed by subjects while they brushed.
• Subjects who met the criteria were scheduled for a baseline visit, balancing on gender and number of seconds the visual pressure sensor was activated. Subjects followed a similar brushing procedure as at the screening visit. They were then randomized to either the Professional 5000 with SmartGuide or the Professional 5000 without SmartGuide.

<table>
<thead>
<tr>
<th></th>
<th>Oral-B Professional 5000 with SmartGuide</th>
<th>Oral-B Professional 5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average time (sec)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>activated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>25.0</td>
<td>18.9</td>
</tr>
<tr>
<td>At Day 30</td>
<td>2.9</td>
<td>8.8</td>
</tr>
<tr>
<td>% decrease</td>
<td>88.6%*</td>
<td>53.4%*</td>
</tr>
</tbody>
</table>

* Statistically significant reduction from baseline ($p=0.031$)
* Statistically significant reduction from baseline ($p=0.032$)
• Subjects used their assigned brush and fluoride toothpaste (Crest Cavity Protection) at home for 30 days. Subjects were asked to complete a usage diary each day to indicate twice a day (AM and PM brushing).
• 30 days after baseline, subjects returned to the clinic with their product and diary and performed another 2-minute brushing. Subjects in the Professional 5000 with SmartGuide group used the same brush they had used at home for 30 days with the SmartGuide visible to them. The Professional 5000 without SmartGuide group used the same brush head used at home but the handle of the brush was the same one they used during screening and baseline visits. Video cameras recorded as with the baseline visit.
Patients with implant-supported fixed prostheses using O-R electric toothbrush improved on all measured parameters

The safety and efficacy of a powered toothbrush on soft tissues in patients with implant-supported fixed prostheses.


KEY CLINICAL RESULTS
• All parameters improved over the course of the 1-year study with the oscillating-rotating powered toothbrush.
• After using the powered toothbrush for 12 months, the mean overall pocket depth decreased from 3.3 mm at baseline to 3.0 mm at 12 months, while the mean decrease in recession was 0.1 mm at 12 months.
• During the 1-year observation, there was a slight gain in periodontal attachment level.
• Gingival ulcerations were not observed at any point in the study.
• High scores for convenience and comfort of the powered toothbrush were reported, and the majority (95%) said that they would continue to use it for habitual oral hygiene.
• 80 patients completed the study. No dropouts were related to the use of the powered toothbrush.

OBJECTIVE
To assess the safety, efficacy and acceptability of an oscillating/rotating powered toothbrush in patients rehabilitated with fixed prostheses on implants.

STUDY DESIGN
• One hundred patients (aged 18-80; mean 56.3; 51 females), who met the inclusion/exclusion criteria and who participated in a regular annual recall scheme, were enrolled. Prior to entering the study, all subjects were on a regular home oral hygiene involving a manual toothbrush and interdental devices.
• Patients were instructed on how to use the Oral-B oscillating-rotating powered toothbrush* as well as on their standard interdental plaque control method. The powered toothbrush had to be used twice daily for 2 min.
• The following periodontal parameters were measured at baseline and at 3 months, 6 months, and 12 months:
  - Presence/absence of gingival and/or mucosal ulceration/desquamation
  - Sulcus bleeding index
  - Probing pocket depth
  - Periodontal pocket-bleeding index
  - Gingival recession
• At 3 months and at the end of the study, patients completed a questionnaire concerning the overall acceptability and convenience of the powered toothbrush, as compared with their habitual manual toothbrush.

* Oral-B Plaque Control Ultra, D9.
Clinical studies evaluating compliance

It has been said that the best toothbrush in the world is the one that the patient likes to use. Compliance is a key factor in good oral hygiene, and, despite decades of health education, the average manual brush user still spends less than a minute brushing his/her teeth and prefers to use a horizontal scrubbing motion.

When the oscillating-rotating toothbrush was first introduced, it included a novel, visible, 2-minute timer. This simple flashing light helped consumers recognize the ideal brushing time and was a motivational aid for longer cleaning time. The 2-minute criterion was based on solid research during which dental professionals performed brushing on subjects. This research showed that while cleaning efficacy increased with time, the majority of the benefit was realized after 2 minutes. Since the origins of the simple flashing-light timer, more compliance-enhancing features have been developed. The concept of dividing the mouth into quadrants and providing a 30-second timer feature to allow thorough cleaning throughout the mouth was incorporated.

Today, Oral-B Power includes Bluetooth® technology to help improve compliance. This innovative app not only monitors time and quadrant cleaning but also indicates when excessive pressure is being used while brushing. The ultimate tests of compliance are patient acceptability and continuance of usage. A large practice-based study of effectiveness and acceptance (Warren et al) reported that 94% of participants would continue to use the oscillating-rotating toothbrush after the end of the study and that 75% said they would recommend the brush to a friend.

Toothbrushing can be a tedious and boring routine, but effective plaque removal and preservation of gingival health can only be achieved by good, thorough oral hygiene practices. Motivation and compliance are critical in achieving oral health, and Oral-B has led the field in providing effective and safe products to improve the oral health of the world’s consumers more completely.
Patients using Oral-B Professional 5000 with SmartGuide improved brushing thoroughness in 30 days

Impact on brushing thoroughness: Oral-B Professional 5000 with SmartGuide.


KEY CLINICAL RESULTS
• Subjects using Oral-B Professional 5000 with SmartGuide for 30 days showed significantly improved brushing thoroughness, including more thorough brushing across the dentition and across lingual and buccal surfaces.

Results: per quadrant (See Figure)
• Brushing was 51% more uniform across quadrants at 30 days, a statistically significant increase versus baseline (p=0.005). Subjects in the control group showed 13% more uniform brushing across quadrants at 30 days, which was not significantly higher than baseline (p=0.448). The between-group comparison for decrease in variance was not statistically significant (p=0.175).

Results: buccal vs lingual
• Subjects using the Professional 5000 with SmartGuide reduced the difference of time spent brushing buccal vs lingual surfaces from an average of 25.5 seconds at baseline to 14.9 seconds at 30 days, which was statistically significant (p=0.022). Subjects using the Professional 5000 without SmartGuide did not significantly change the difference between buccal and lingual times from an average of 28.5 seconds at baseline to 22.7 seconds at 30 days (p=0.268). The between-group comparison for change in buccal vs lingual brushing time was not statistically significant (p=0.113).

Results: percent of subjects improving (see Table)
• To determine the percent of subjects in each group with improved brushing thoroughness at 30 days versus baseline, each subject’s data were evaluated independently.

OBJECTIVE
To evaluate the effect of Oral-B Professional 5000 with SmartGuide on improving brushing thoroughness. (Brushing pressure was also assessed in this study; results are summarized separately.)

STUDY DESIGN
• Randomized, 2-treatment, parallel-group, 30-day study with subjects identified as using excessive brushing force at a screening visit.
• At the baseline visit, subjects were videotaped brushing. The SmartGuide display was also videotaped.
• Subjects were randomized to Professional 5000 with SmartGuide or Professional 5000 without SmartGuide and instructed to use their assigned toothbrush at home according to manufacturer’s instructions.
• Subjects returned at Day 30 and performed a 2-minute brushing in front of a 2-way mirror. The display was visible to subjects in the SmartGuide group. Each subject’s brushing behavior and the SmartGuide were videotaped.
Brushing thoroughness was tested by measuring: 1) time spent brushing in each quadrant; and 2) time spent brushing buccal versus lingual surfaces.

Variance in quadrant brushing times and the difference in time spent brushing the buccal/lingual surfaces was calculated. Values closer to zero indicate more consistent and thorough brushing.

Considering a 2-minute brushing, variance of zero indicates brushing in each quadrant for 30 seconds per quadrant. A difference of zero in time between buccal and lingual surfaces indicates brushing each of the 2 areas for 60 seconds.

**Figure. Average Variance among Quadrant Brushing Times: SmartGuide Group**

**Table. Subjects showing improvement for brushing thoroughness**

<table>
<thead>
<tr>
<th></th>
<th>Oral-B Professional 5000 with SmartGuide N=26</th>
<th>Oral-B Professional 5000 without SmartGuide N=21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Across quadrants</td>
<td>80%</td>
<td>67%</td>
</tr>
<tr>
<td>Buccal vs. lingual surfaces</td>
<td>76%</td>
<td>57%</td>
</tr>
</tbody>
</table>
Clinical Evaluation of an Interactive Toothbrush among Adolescents


KEY CLINICAL FINDINGS
- The Oral-B Smart Series 6000 interactive power toothbrush with Precision Clean brush head removed statistically significantly more plaque ($P<0.001$) and increased brushing time ($P<0.001$) compared to a manual toothbrush control after two weeks of use.
- Baseline plaque means were 2.5 for whole mouth and 3.2 for Focused Care* areas across both brush groups. After two weeks, whole mouth mean plaque reductions were 0.9 for the interactive power toothbrush and 0.04 for the control. The Week 2 Focused Care areas mean plaque reductions were 1.2 for the interactive brush and 0.2 for the control. See Figure 1.
- Screening brushing times were 109 seconds and 119 seconds for the interactive brush and the manual brush groups, respectively. After 2 weeks, only the interactive power toothbrush group showed significant increase in brushing time to 144 seconds ($P<0.001$), while there was no improvement for the manual brush users (118 seconds, $P=1.000$).

OBJECTIVE
To evaluate the plaque removal efficacy and brushing time of an interactive power toothbrush versus a manual toothbrush among adolescents over a 2-week period.
METHODS

- This was a randomized, 2-treatment, 2-week, parallel design clinical trial.
- 60 adolescent manual brush users aged 13–17 years with evidence of dental plaque were enrolled. Plaque was assessed at Screening, Baseline and Week 2 using the Turesky-modified Quigley-Hein Plaque Index (TMQHPI) and individual Focused Care plaque areas were identified for each subject.
- At the Baseline visit, subjects were randomized to one of the following two treatment groups and instructed to brush twice daily for two weeks, spending 2 minutes plus additional time (10 seconds) on each Focused Care area:
  - The interactive toothbrush (Oral-B Smart Series 6000 with Precision Clean brush head, Procter & Gamble) connected to the Smartphone Oral-B App (v2.1) or
  - Manual toothbrush control (Oral-B Indicator, Procter & Gamble)
- Brushing time was recorded at Screening (subjects used their own manual brush) and after 2 weeks of assigned product use.
- ANCOVA model was used for statistical analyses for plaque and Wilcoxon Rank sum test for brushing time.

* Dental professionals can program patients’ brushing routine in the App and identify Focused Care areas where patients need to spend more time brushing. Ten seconds per Focused Care area are added to the 2-minute brushing.
Patients were 5x more likely to brush for 2 minutes 2x per day with Oral-B Professional 5000 with SmartGuide

A 30-day clinical comparison of two toothbrushes in brushing time.

**OBJECTIVE**
To determine if using a rechargeable power toothbrush with a remote timer encouraged subjects to brush longer versus a manual toothbrush.

Test brushes were:
- Oral-B Professional 5000 with SmartGuide
- Oral-B® Advantage® Plus #40 soft manual toothbrush

**STUDY DESIGN**
This was a 2-treatment, open label, randomized, parallel group trial. Generally healthy subjects, 18–70 years of age, with at least 16 natural teeth, who met entry criteria and gave informed consent were randomized to 1 of 2 groups. Subjects were given written and verbal instructions to brush unsupervised twice daily according to the manufacturer’s instructions at home for 1 week.

After 1 week, subjects returned for the baseline visit, including an oral safety exam. Subjects were verbally instructed to:
- Use the test product exclusively.
- Brush according to the manufacturer’s instructions for the power brush and in their usual manner for 2 minutes for the manual toothbrush.
- Use the preprogrammed timer in the power brush and the separate digital timer with the manual toothbrush. Brushing times were recorded to the second on the case report form.
- Maintain a diary form to record dates, times of brushing, and comments.

Before leaving, subjects performed a supervised usage of their assigned product and timer to ensure proper product usage. Crest Cavity Protection toothpaste was supplied to all subjects for use during the study. Subjects returned to the test facility for their final visit 30 days later. Average brushing time per subject was used as the response variable. The 2 treatment groups were compared using a 2 sample t-test.
To get access to more clinicals and a wealth of scientific information, visit www.dentalcare.com.
For more information about Oral-B Power, visit www.dentalcare.com.