



Results you'll be proud to recommend.  
The science behind the new Philips Sonicare For Kids.

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## Notes from Dr. Joerg Strate

Vice President, Philips Oral Healthcare,  
Clinical & Scientific Affairs

### **Sonicare For Kids—The First Sonicare Power Toothbrush Designed for Children**

Sonicare power toothbrushes have been the benchmark of modern oral hygiene devices ever since their first introduction nearly two decades ago. The combination of the most sophisticated technology and a unique user experience has provided patients around the world with outstanding results. The improvement of oral hygiene and maintenance of oral health have been recognized as key components of a healthy lifestyle. Establishing such habits and behaviors in children presents a unique challenge and an opportunity. Dental caries remains the most common chronic childhood disease despite the continued efforts to raise awareness of this risk.

Developing a Sonicare power toothbrush specifically designed for the needs of children seemed overdue. As with any Sonicare power toothbrush, Sonicare For Kids had to be supported by sound clinical research that validates its high performance compared to other available solutions. But this Sonicare toothbrush had to do a lot more than that. The unique needs of children, as well as their gradually increasing dexterity, needed to be reflected in the design of this particular Sonicare. It was also essential that it be designed to excite children and parents alike.

The clinical research included here is an impressive testimonial of these accomplishments. Sonicare For Kids is the first of its kind, and it may change the way we look at prevention and oral hygiene in children.

# Table of Contents

Plaque Removal	1 – 6
Compliance	7 – 9
Preference	10-13





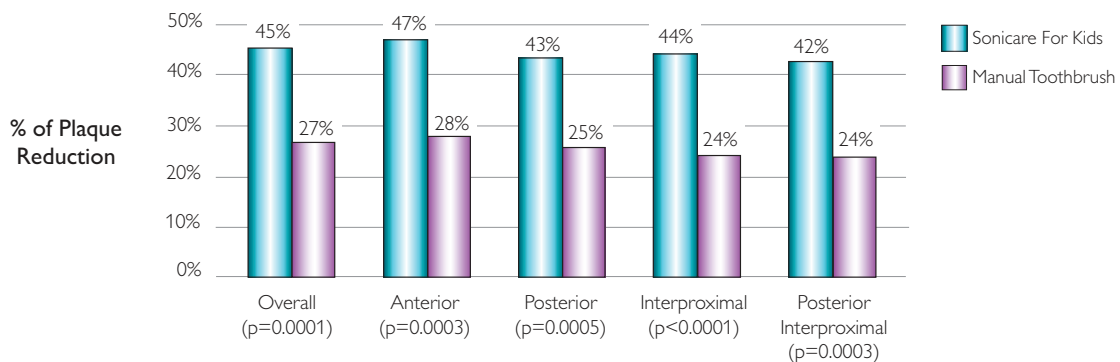
# Plaque Removal

*in vivo study*

## Comparison of plaque removal by Sonicare For Kids and a manual toothbrush in children aged 7–10 years

Milleman J, Putt M, Olson M, Master A, Jenkins W, Schmitt P, Strate J. *International J Pediatric Dent.* 2009; 19:s1

Objective	To compare the plaque removal efficacy and safety of Sonicare For Kids at “high” setting and Oral-B Stages 4® manual toothbrush (MTB) in children aged 7–10 years.
Methodology	Fifty-eight healthy children enrolled in and four withdrew from an IRB-approved single-blind, randomized, parallel-design study (totaling 32 females, 22 males; mean age 8.3 years). Informed consent/assent (with parent) was obtained. All subjects abstained from brushing for 26 ± 6 hours prior to examination visits. At Visit 1, subjects were screened for eligibility (Turesky-Modified Quigley-Hein Plaque Index (TPI) >1.8). Eligible subjects were enrolled and instructed on use of both devices (Sonicare For Kids and MTB) in alternating manner at home (twice daily for two minutes) for a one-week familiarization period. At Visit 2, baseline TPI was performed followed by a randomization and supervised two-minute brushing session with the assigned device. Post-brushing TPI scores were then obtained. Safety was assessed in oral soft tissue examinations at Visit 2. ANOVA was used for the primary statistical analysis.
Results	Sonicare For Kids removed significantly more plaque than a manual toothbrush from the dentition overall ( $p=0.0001$ ) as well as in hard-to-reach areas, i.e., the posterior teeth ( $p=0.0005$ ) and the interproximal spaces ( $p<0.0001$ ) of children aged 7–10 years. Both toothbrushes were safe to use.
Conclusion	Sonicare For Kids was found to remove significantly more plaque than Oral-B Stages 4 manual toothbrush in children aged 7–10 years. It is also proven safe and gentle on oral tissues.



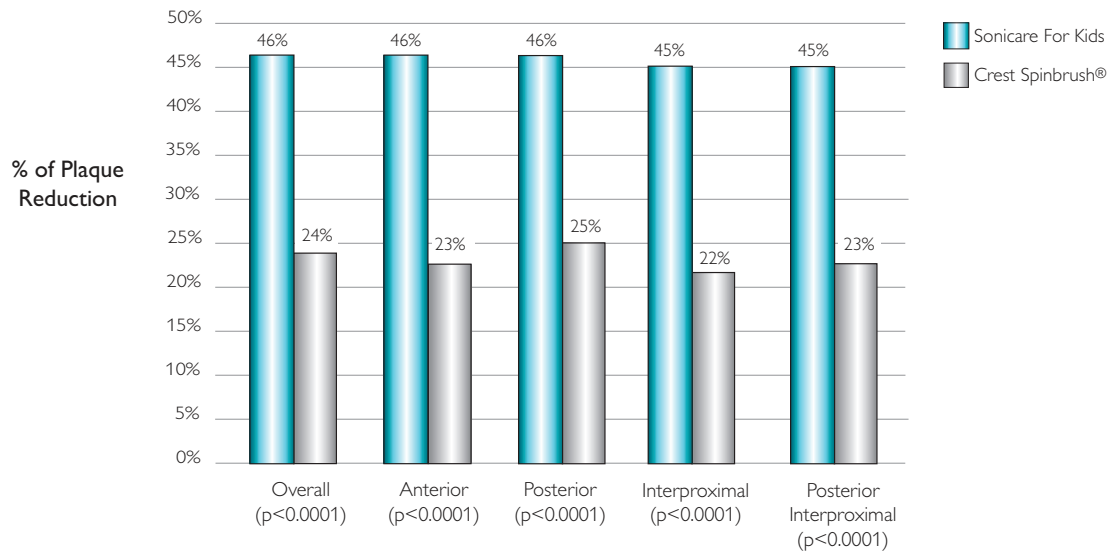
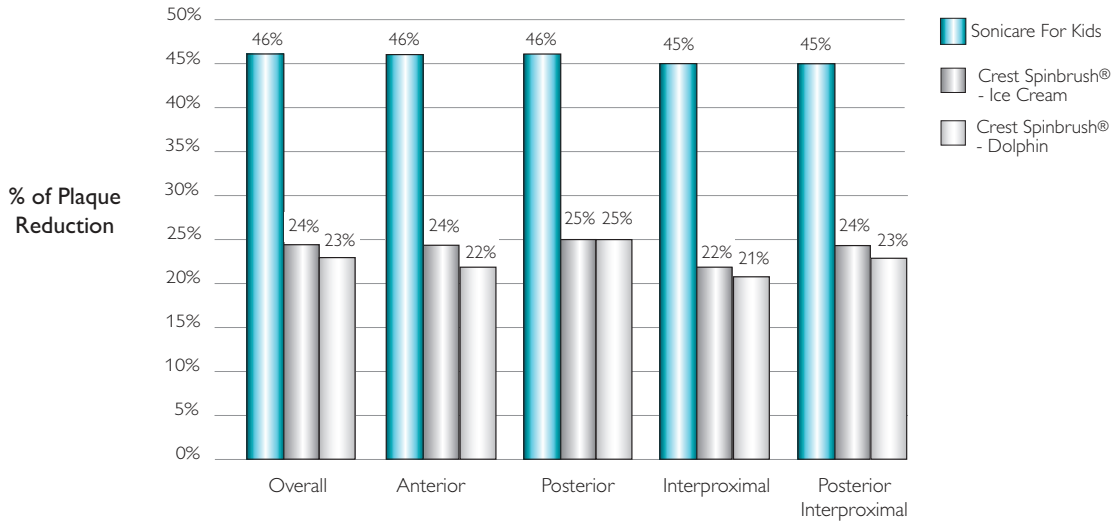
# Plaque Removal

*in vivo study*

## Comparison of plaque removal by Sonicare For Kids and a Crest battery-powered Spinbrush® for Kids in children aged 7–10 years

Milleman J, Putt M, Olson M, Master A, Jenkins W, Schmitt P, Strate J. *International J Pediatric Dent.* 2009; 19:s1

Objective	To compare the plaque removal efficacy of Sonicare For Kids at “high” setting and Crest battery-powered Spinbrush for Kids (“dolphin” and “ice cream cone” handle shapes) in children aged 7–10 years.
Methodology	Fifty-nine healthy children (mean age 8.5 years) participated in an IRB-approved single-blind, randomized, parallel-design study. Informed consent/assent (with parent) was obtained. Subjects abstained from brushing for 26 ± 6 hours prior to examination visits. At Visit 1, subjects were screened for eligibility (Turesky-Modified Quigley-Hein Plaque Index (TPI) >1.8). They were instructed on use of both devices (Sonicare For Kids and Crest Spinbrush for Kids) in alternating manner at home (twice daily for two minutes) for a one-week familiarization period. At Visit 2, baseline TPI was scored followed by randomization and a supervised two-minute brushing session with the assigned device. Post-brushing TPI scores were then obtained. Safety was assessed in oral soft tissue examinations at Visit 2. ANOVA was used for the primary statistical analysis.
Results	Sonicare For Kids removed significantly more plaque than Crest Spinbrush for Kids (“dolphin” and “ice cream cone” handle shapes) from the dentition overall ( $p < 0.0001$ ) as well as in hard-to-reach areas, i.e., the posterior teeth ( $p = 0.0001$ ) and the interproximal spaces ( $p < 0.0001$ ) of children aged 7–10 years. Both toothbrushes were safe to use.
Conclusion	Sonicare For Kids was found to remove significantly more plaque than Crest Spinbrush for Kids in children aged 7–10 years. It is also proven safe and gentle on oral tissues.



## Plaque Removal

*in vivo study*

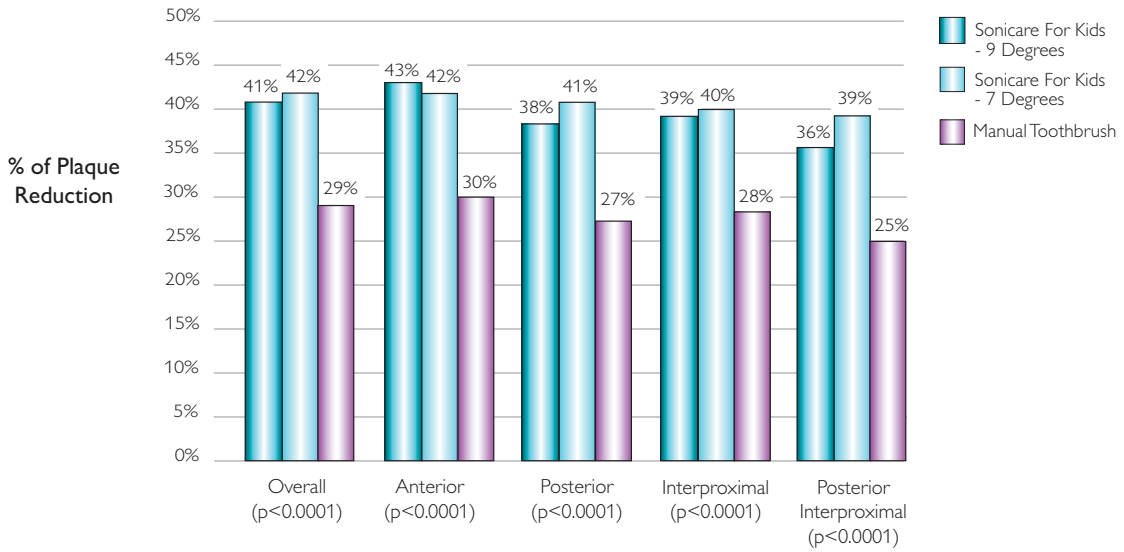
### Comparison of plaque removal by Sonicare For Kids and a manual toothbrush in children aged 4–7 years in a professionally applied toothbrushing study

Pelka M, DeLaurenti M, Master A, Jenkins W, Strate J, Wei J, Schmitt P. *International J Pediatric Dent.* 2009; 19:s1

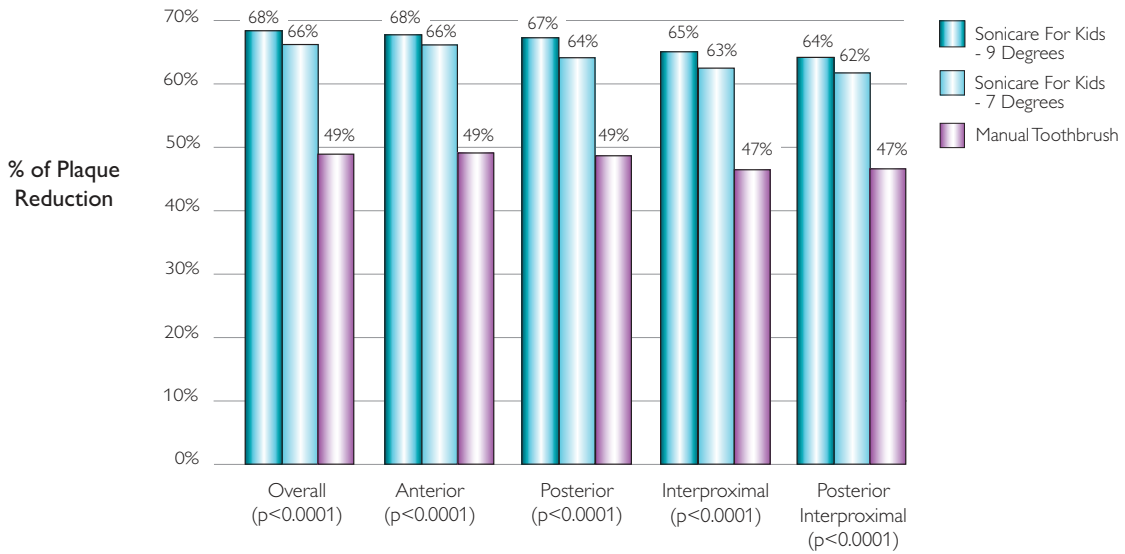
Objective	To compare the plaque removal efficacy of Philips Sonicare For Kids at “high” and “low” settings and Oral-B Stages 3® manual toothbrushes in a professionally applied brushing session simulating one and two minutes of brushing time in children aged 4–7 years.
Methodology	Sixty-eight healthy children (38 females, 30 males; mean age 5.3 years) participated in an IRB-approved single-blind, randomized, split-mouth-design study. Informed consent/assent (with parent) was obtained. Subjects were screened for eligibility (Turesky-Modified Quigley-Hein Plaque Index (TPI) >1.8). Eligible subjects were randomized to Sonicare For Kids “high,” Sonicare For Kids “low” and a manual toothbrush by quadrant and were brushed accordingly by clinical hygienists. TPI was scored at one- and two-minute interval equivalents by quadrant by a blinded examiner. Safety was assessed in oral soft tissue examinations. For statistical analysis, MANOVA for a split-mouth-design was applied and P-values were adjusted using the Dunnett-Hsu adjustment.
Results	Sonicare For Kids (in “high” and “low” settings) removed significantly more plaque than a manual toothbrush from the dentition overall ( $p < 0.0001$ ) as well as in hard-to-reach areas, i.e., the posterior teeth ( $p < 0.0001$ ) and the interproximal spaces ( $p < 0.0001$ ) at one- and two-minute brushing intervals in children aged 4–7 years with professionally applied brushing sessions. Both toothbrushes were safe to use.
Conclusion	Sonicare For Kids was found to remove significantly more plaque than Oral-B Stages 3 manual toothbrush in children aged 4–7 years with professionally applied brushing. It is also proven safe and gentle on oral tissues.



Adjusted Mean Percent Plaque Reduction, Squirt Prototype  
7 and 9 Degrees vs. Manual Toothbrush, 1-Minute Equivalent



Adjusted Mean Percent Plaque Reduction, Squirt Prototype  
7 and 9 Degrees vs. Manual Toothbrush, 2-Minute Equivalent



# Plaque Removal

*in vivo study*

## Comparison of plaque removal by Sonicare For Kids and a Colgate® children’s battery toothbrush in children aged 7–10 years

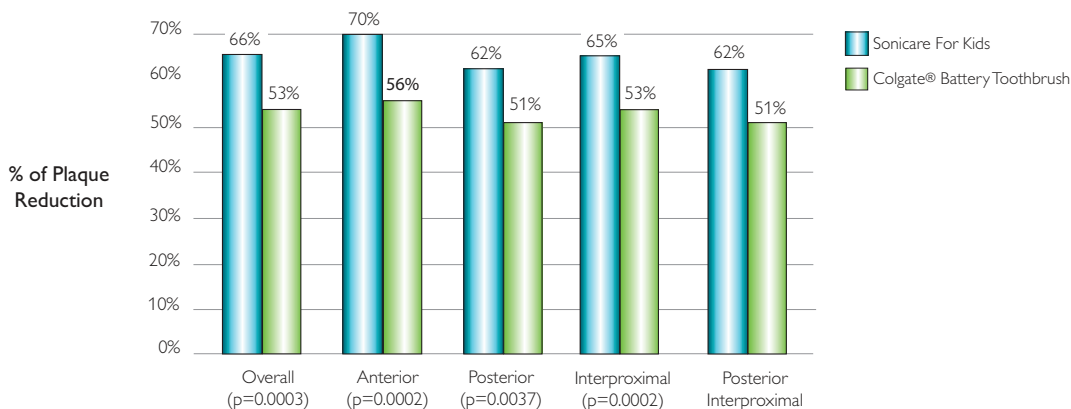
Payne D, Rimmer P, Olson M, Master A, Jenkins W, Schmitt P, Strate J. *International J Pediatric Dent.* 2009; 19:s1

**Objective** To compare the plaque removal efficacy and safety of Philips Sonicare For Kids at “high” setting and Colgate children’s battery toothbrushes (“Shrek” handle design) in children aged 7–10 years.

**Methodology** Sixty-nine healthy children (mean age 8.4 years) participated in an EC-approved single-blind, randomized, parallel-design study. Informed consent/assent (with parent) was obtained. Subjects abstained from brushing for 26 ± 6 hours prior to examination visits. At Visit 2, subjects were screened for eligibility (Turesky-Modified Quigley-Hein Plaque Index (TPI) >1.8). Eligible subjects were instructed on use of both devices (Sonicare For Kids and Colgate children’s battery toothbrush) in alternating manner at home (twice daily for two minutes) for a one-week familiarization period. At Visit 3, baseline TPI was scored followed by randomization and a supervised two-minute brushing session with the assigned device. Post-brushing scores were obtained by scoring TPI. Safety was assessed in oral soft tissue examinations at Visit 3. ANOVA was used for the primary statistical analysis.

**Results** Sonicare For Kids removed significantly more plaque than a Colgate children’s battery toothbrush from the dentition overall (p=0.0003) as well as in hard-to-reach areas, i.e., the posterior teeth (p=0.0037) and the interproximal spaces (p=0.0002) of children aged 7–10 years. Both toothbrushes were safe to use.

**Conclusion** Sonicare For Kids was found to remove significantly more plaque than Colgate children’s battery toothbrush in children aged 7–10 years. It is also proven safe and gentle on oral tissues.



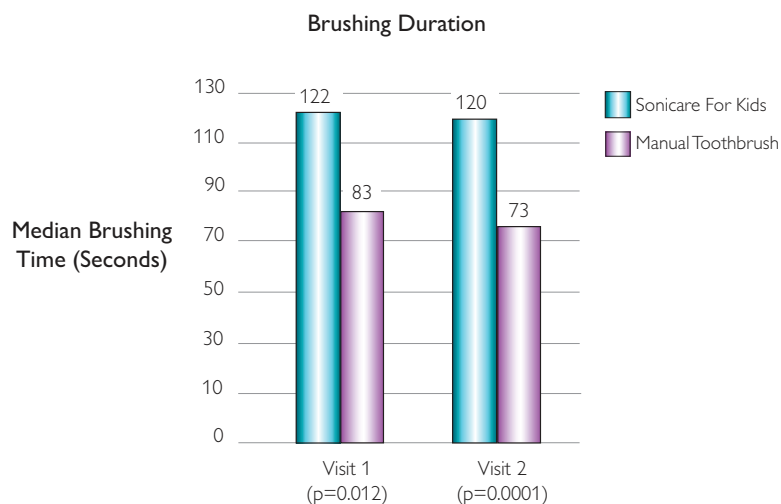
# Compliance

*in vivo study*

## Brushing duration and use interaction patterns of manual versus sonic toothbrushes in children aged 7–10 years

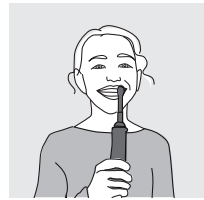
Defenbaugh J, Schmitt P, Master A, Jenkins W, Strate J. *International J Pediatric Dent* 2009; 19:s1

- Objective** To compare the brushing duration and use interaction patterns in children aged 7–10 years using a Sonicare For Kids power toothbrush versus Oral-B Stages 4® manual toothbrush.
- Methodology** Sixty healthy subjects (31 females, 29 males) were enrolled in an IRB-approved randomized, parallel-design two-week study. Informed consent/assent was obtained. At Visit 1, eligible subjects were randomized and provided brushing instructions. They performed an on-site brushing session immediately thereafter. It was timed and video recorded for duration and use interaction data collection. A home-use period of two weeks commenced with the assigned product in order for subjects to familiarize with the device. At Visit 2, the brushing and recording procedure was repeated and subjects were dismissed. Longitudinal and between-group comparisons were assessed for duration and ergonomic use interaction events. Statistical analysis was performed using the Wilcoxon Test.
- Results** Thirty-one subjects were randomized to Sonicare For Kids and twenty-nine to a manual toothbrush. A longer median brushing duration was observed for Sonicare For Kids users at both time points. Sonicare For Kids (122 seconds) compared to manual toothbrush (83 seconds) at visit 1 ( $p=0.012$ ). Sonicare For Kids (120 seconds) compared to manual toothbrush (73 seconds) at visit 2 ( $p=0.0001$ ).



In video analysis review by an ergonomic expert, use interaction brush artifacts occurred more frequently with a manual toothbrush than with Sonicare For Kids, 1.56 compared to 0.80.

Use Interaction Brush Artifacts



Vertical Brushing



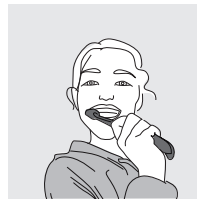
Shoulder Abduction



Wrist Extension / Hyperextension



Obvious Loose Grip

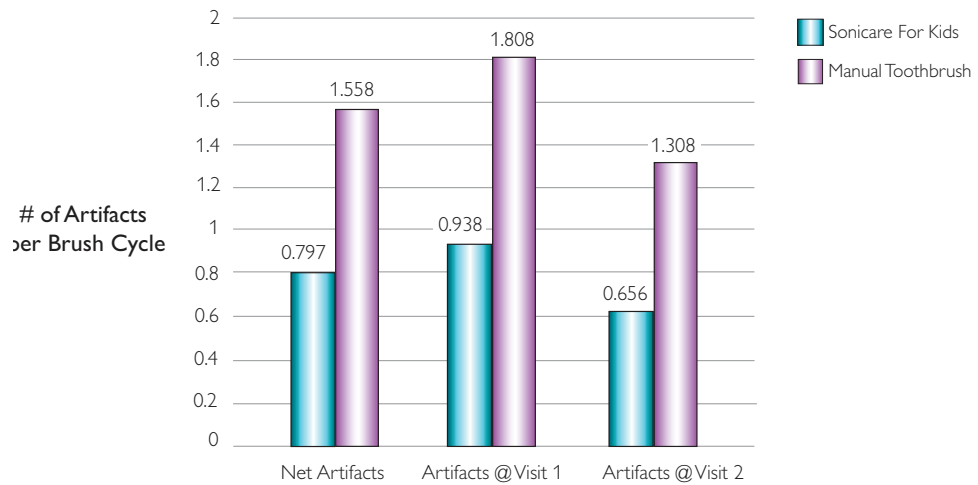


Obvious Over Grip



Finger Extension

Use Interaction Comparison



It was also observed that Sonicare For Kids toothbrush users prefer to grip with their fingertips, while manual toothbrush users prefer a power grip.

Grip Types

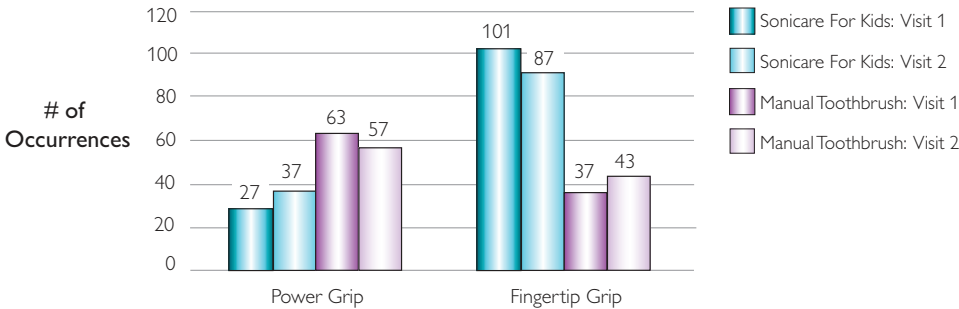


Power Grip Preferred for Manual Toothbrush



Fingertip Grip Preferred for Sonicare For Kids

Grip Type Comparison



For both types of brush, users prefer to grip in the center of the brush handle. Users did not typically switch between grips or hand location during brushing cycles or between brushing cycles.

**Conclusion** Children aged 7–10 years brushed significantly longer with Sonicare For Kids than with a manual toothbrush following immediate product introduction and after a period of home use. Use interaction comparison suggests that form factor may influence the frequency of artifact occurrence.

## Preference

### An observational in-home use test of children 4-10 years using Sonicare For Kids

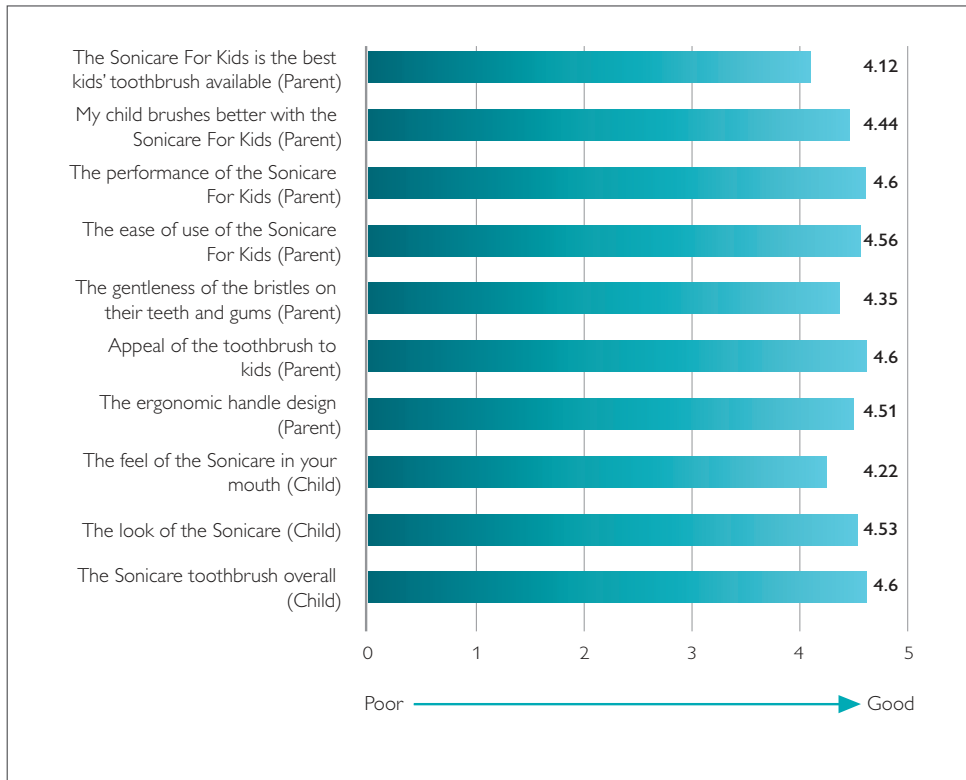
Jenkins W, Master A, Defenbaugh J, Wei J. Philips Oral Healthcare, Snoqualmie, WA; *J Dent Res* 89 (spec iss B); Abstract 3696, 2010

Introduction	The performance of an oral care product is fundamentally limited to the user's willingness to accept it into their regimen. In a product designed for children, the suitability of the experience (in all its dimensions) is as much a barrier to success as any primary metric of effective performance. Therefore, we conducted an in-home use study with a novel power toothbrush for children.
Objective	To evaluate whether the Philips Sonicare For Kids toothbrush, designed to positively influence engagement, experience and motivation, results in an acceptable and successful home toothbrushing experience between parents and children.
Methodology	Eligible participants included dental professional (DP) adults (from across North America) with children aged 4-10 years. All children received the Philips Sonicare For Kids toothbrush. A total of 75 DP parents with 105 participating children (51 girls, 54 boys) completed the three-week survey. Parents were asked to introduce the Philips Sonicare For Kids to their child/children for routine use at home per the manufacturer's instructions. Participants were not restricted from use of any other oral care products. Parents were asked to report observations of the child's use patterns, attitudes and behaviors through online questionnaires (Survey Monkey).
Results	<p>In a survey of DP parents where the Philips Sonicare For Kids toothbrush was used by their 4-10 year-old children for a three-week period, respondents observed:</p> <ul style="list-style-type: none"> <li>• greater motivation brushing with Sonicare For Kids compared to their prior toothbrush, 90%</li> <li>• better brushing with Sonicare For Kids compared to their prior toothbrush, 88%</li> <li>• that their child brushed longer with Sonicare For Kids (mean: 104 seconds, median: 120 seconds) compared to their prior toothbrush (mean: 64 seconds, median: 60 seconds)</li> </ul> <p>In addition:</p> <ul style="list-style-type: none"> <li>• 81% of DP parents would recommend Sonicare For Kids to their patients</li> <li>• 91% of DP parents prefer Sonicare For Kids for use as their children's primary toothbrush</li> <li>• 93% of DP parents were highly satisfied with the cleaning performance of Sonicare For Kids</li> <li>• 84% of DP parents were highly satisfied with the gentleness of Sonicare For Kids</li> <li>• 91% of DP parents were highly satisfied with the ease of use of Sonicare For Kids</li> </ul>

- 84% of DP parents reported that their children were highly satisfied with the in-mouth feel when using Sonicare For Kids
- 92% of DP parents reported that their children were highly satisfied with the look of Sonicare For Kids
- 93% of DP parents reported that their children were highly satisfied with the overall experience of using Sonicare For Kids
- 89% of DP parents reported that their children preferred Sonicare For Kids to their prior toothbrush

**Conclusion**      The Philips Sonicare For Kids toothbrush positively influences engagement and promotes healthy brushing behavior in children 4-10 years old.

Toothbrush Attributes



Brushing Duration

Brushing Duration (Median)			
	Overall	4-6 Years	7-10 Years
Sonicare	120 sec	110 sec	120 sec
Previous Toothbrush	60 sec	60 sec	60 sec

## Preference

### An observational in-home use test of children 4-10 years using Sonicare For Kids

Jenkins W, Master A, Defenbaugh J, Wei J. Philips Oral Healthcare, Snoqualmie, WA; *J Dent Res* 89 (spec iss B); Abstract 3696, 2010

Introduction	The Sonicare For Kids toothbrush was specifically designed to grow with children 4-10 years old and suit their particular needs. In this population, the suitability of the toothbrushing experience (in all its dimensions) is as much a barrier to success as any primary metric of effective performance. This in-home use test was done with a group of hygienists because this population of trained dental professionals was expected to reflect the most critical and detailed feedback possible, not only in the dimension of the experience of introduction of the product, but also in characterization of its performance and ability to promote independent brushing of an acceptable standard.
Objective	To gain feedback and observe behavior changes in 4-10 year-old children or pediatric patients of registered dental hygienists (RDHs) after use of the Philips Sonicare For Kids toothbrush at home, in order to assess whether its introduction into the home toothbrushing regime promoted better oral health habits by positively influencing the child's motivation and experience.
Methodology	Eligible participants included adult RDHs (from RDH Under One Roof Conference who attended the course "New and Innovative Products of 2009") with a patient, child, friend or family member aged 4-10 years. All children received the Philips Sonicare For Kids toothbrush. A total of 131 RDHs with participating children (58 girls, 73 boys) completed the four-week survey. Parents were asked to introduce the Philips Sonicare For Kids to their child/children for routine use at home per the manufacturer's instructions. Participants were not restricted from use of any other oral care products. Parents were asked to report observations of the child's use patterns, attitudes and behaviors through online questionnaires (Survey Monkey).
Results	Where the Philips Sonicare For Kids toothbrush was used by their 4-10 year-old children for a three-week period, study participants observed longer brushing time, willingness to brush and improved quality of brushing. In addition: <ul style="list-style-type: none"> <li>• 98% of RDHs would recommend Sonicare For Kids to their patients</li> <li>• 93% of RDHs noticed improvements in the child's brushing habits after use of Sonicare For Kids</li> <li>• 99% of RDHs were highly satisfied with the performance of Sonicare For Kids</li> <li>• 96% of RDHs were highly satisfied with the gentleness of Sonicare For Kids</li> <li>• 98% of RDHs reported that their children were highly satisfied with the overall experience of using Sonicare For Kids</li> </ul>

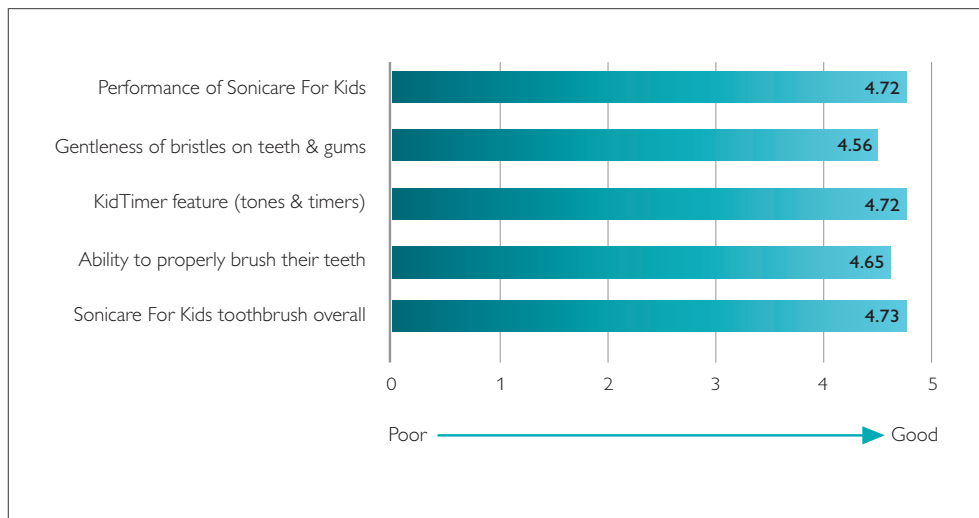


- 97% of RDHs reported on their children’s ability to properly brush their teeth with Sonicare For Kids
- 93% of RDHs reported that the child will continue to use Sonicare For Kids rather than their previous toothbrush

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The Philips Sonicare For Kids toothbrush positively influences engagement and promotes healthy brushing behavior in children 4-10 years old.

Product Attributes (n=131)









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