The Waterpik® Water Flosser Removes 99.9% of Plaque Biofilm After 3-Second Treatment

Biofilm Removal with a Dental Water Jet

Study conducted at the University of Southern California School of Dentistry, USC Center for Biofilms, Los Angeles, California.

Objective
To evaluate the effect of the Waterpik® Water Flosser on plaque biofilm removal using scanning electron microscopy (SEM).

Methodology
Eight periodontally involved teeth were extracted. Ten slices were cut from four teeth and were inoculated with saliva and left for four days to further grow plaque biofilm. Four slices were treated with the Classic Jet Tip, four slices were treated with the Orthodontic Tip, and two slices were used as controls. The remaining 4 teeth were treated with the Orthodontic Tip to evaluate the removal of calcified plaque biofilm. All teeth were treated using medium pressure for three seconds and evaluated by SEM.

Results
The Classic Jet Tip removed 99.9% and the Orthodontic Tip removed 99.8% of the plaque biofilm from the treated areas after a 3-second exposure as viewed by SEM. The Orthodontic Tip significantly removed the calcified biofilm from the surface of the four teeth as viewed by the naked eye and SEM.

Conclusion
The Waterpik® Water Flosser significantly removes plaque biofilm.
**Waterpik® Water Flosser: Significantly More Effective than String Floss for Removing Plaque**

Evaluation of the Plaque Removal Efficacy of a Water Flosser Compared to String Floss in Adults After a Single Use


**Objective**
To compare the plaque removal efficacy of the Waterpik® Water Flosser to string floss combined with a manual toothbrush.

**Methodology**
Seventy subjects participated in this randomized, single use, single blind, parallel clinical study. Subjects abstained from any oral hygiene for 23 – 25 hours prior to their appointment. Subjects were screened and assigned to one of two groups: Waterpik® Water Flosser plus a manual toothbrush, or waxed string floss plus a manual toothbrush. Instructions were provided for each product used. Each participant brushed for 2-minutes using the Bass method. Group 1 used the Water Flosser with 500 ml of warm water and Group 2 used waxed string floss cleaning all areas between the teeth. Subjects were observed to make sure they covered all areas and followed instructions. Scores were recorded for whole mouth, marginal, approximal, facial, and lingual regions for each subject using the Rustogi Modification Navy Plaque Index.

**Results**
The Waterpik® Water Flosser was 29% more effective than string floss for overall plaque removal, 29% for approximal surfaces, and 33% for marginal surfaces.

**Conclusion**
The Waterpik® Water Flosser is significantly more effective than string floss in removing plaque for all tooth surfaces.
**Waterpik® Water Flossers:**
Over 50% More Effective than String Floss for Reducing Gingivitis

Comparison of Irrigation to Floss as an Adjunct to Toothbrushing: Effect on Bleeding, Gingivitis and Supragingival Plaque

Study conducted at the University of Nebraska Medical Center, College of Dentistry, Lincoln, Nebraska.

**Objective**
To evaluate the ability of a Waterpik® Water Flosser paired with either a power or manual toothbrush, and a manual toothbrush and floss, to reduce gingivitis, bleeding and supragingival plaque biofilm.

**Methodology**
One hundred five subjects participated in this four-week study. One group used a Waterpik® Water Flosser with a manual toothbrush and a second used the Waterpik® Water Flosser with a power toothbrush. The control group used a manual toothbrush and floss. Subjects brushed twice daily and used either the Water Flosser or dental floss once daily. Plaque biofilm, bleeding, and gingivitis were evaluated at two and four weeks.

**Results**
At 4 weeks, the addition of a Water Flosser resulted in significantly better oral health, regardless of toothbrush type used over manual brushing and flossing. Adding the Waterpik® Water Flosser was up to 93% better in reducing bleeding and up to 52% better at reducing gingivitis than traditional dental floss.

**Conclusion**
The Waterpik® Water Flosser is an effective alternative to traditional dental floss for reducing gingivitis.
**Waterpik® Water Flosser: Twice as Effective as String Floss for Reducing Gingival Bleeding**

The Effect of Different Interdental Cleaning Devices on Gingival Bleeding

Study conducted at the University of Amsterdam, Academic Center for Dentistry, Amsterdam.

**Objective**
To evaluate the efficacy of a manual toothbrush plus a Waterpik® Water Flosser versus a manual toothbrush plus traditional floss, to reduce gingival bleeding and plaque biofilm.

**Methodology**
One hundred four subjects participated in this 30-day, randomized, single blind study. Group A used a Waterpik® Water Flosser with the Classic Jet Tip plus a manual toothbrush, Group B used a Waterpik® Water Flosser with the Plaque Seeker® Tip plus a manual toothbrush and Group C used waxed string floss plus a manual toothbrush. Subjects brushed twice daily and used either the Water Flosser or floss once daily in the evening. Gingival bleeding and plaque biofilm were evaluated at day 14 and day 30.

**Results**
After 14 days, used in conjunction with manual toothbrushing, the Waterpik® Water Flosser with the Classic Jet Tip was twice as effective as traditional floss at reducing gingival bleeding. At 30 days, the relative improvement in gingival bleeding for the Water Flosser groups was even more dramatic. There were no significant differences between the Water Flosser Classic Jet Tip and the Plaque Seeker® Tip. No differences were reported in plaque biofilm reductions between the three groups.

**Conclusion**
The Waterpik® Water Flosser is a more effective alternative to traditional dental floss for reducing gingival bleeding and improving oral health.
Waterpik® Water Flosser: Significantly More Effective than Sonicare® Air Floss for Single Use Plaque Removal

Comparison of Two Power Interdental Cleaning Devices on Plaque Removal


Objective
To evaluate the plaque removal efficacy of the Waterpik® Water Flosser and Sonicare® Air Floss combined with a manual toothbrush after a single use.

Methodology
Eighty-two subjects participated in this randomized, single use, single blind clinical study. Subjects were assigned to one of two groups: Waterpik® Water Flosser plus a manual toothbrush, or Sonicare® Air Floss plus a manual toothbrush. Subjects were instructed on the proper use of each device based on manufacturer’s directions. Instructions on the Bass method of toothbrushing were also provided. The interdental cleaning device was used first followed by a two-minute toothbrushing. Scores were recorded for whole mouth, marginal, approximal, facial, and lingual regions for each subject using the Rustogi Modified Navy Plaque Index.

Results
The Waterpik® Water Flosser was 30% more effective than the Sonicare® Air Floss for overall plaque removal. Notably, the Water Flosser was 45% more effective for lingual surfaces and 60% more effective at the gingival margin, areas prone to plaque and calculus accumulation.

Conclusion
The Waterpik® Water Flosser is significantly more effective than Sonicare® Air Floss in removing plaque for all tooth surfaces.
Waterpik® Water Flosser: 80% More Effective than Sonicare® Air Floss for Reducing Gingivitis

Comparison of Two Power Interdental Cleaning Devices on the Reduction of Gingivitis


Objective
To compare the Waterpik® Water Flosser to the Sonicare® Air Floss for the reduction of gingivitis and plaque biofilm over a 4 week period.

Methodology
Eighty-two subjects participated in this 4 week, randomized, single blind, clinical study. Subjects were assigned to one of two groups: Waterpik® Water Flosser plus a manual toothbrush; or Sonicare® Air Floss plus a manual toothbrush. Subjects were instructed on the proper use of the interdental cleaning devices based on manufacturer’s directions. Instructions on the Bass method of toothbrushing were also provided. Gingivitis scores were recorded for whole mouth, facial, and lingual using the Modified Gingival Index. Plaque scores were recorded for whole mouth, facial, lingual, marginal, and approximal regions using the Rustogi Modified Navy Index.

Results
The Waterpik® Water Flosser was significantly more effective than Sonicare® Air Floss at reducing plaque and gingivitis for all areas measured after 4 weeks of use. The Water Flosser was 80% more effective than Air Floss for overall gingivitis reduction, and was 70% more effective for plaque reduction. Notably, the Water Flosser was twice as effective for plaque removal from lingual surfaces and more than 3 times as effective at the gingival margin vs. Air Floss.

Conclusion
The Waterpik® Water Flosser is significantly more effective than Sonicare® Air Floss for reducing gingivitis and plaque.
The Waterpik® Water Flosser is 3X as Effective as String Floss for Orthodontic Patients

The Effect of a Dental Water Jet with Orthodontic Tip on Plaque and Bleeding in Adolescent Orthodontic Patients with Fixed Orthodontic Appliances


Objective
To compare the use of a manual toothbrush and the Waterpik® Water Flosser with the Orthodontic Tip to manual toothbrushing and flossing with a floss threader on bleeding and plaque biofilm reductions in adolescents with fixed orthodontic appliances. A control group consisted of brushing only.

Methodology
One hundred five adolescents with fixed orthodontics participated in this single-center, randomized study. Bleeding and plaque biofilm scores were collected at baseline and days 14 and 28.

Results
The Waterpik® Water Flosser was over 3 times more effective than flossing and over 5 times more effective than brushing alone for the reduction of plaque biofilm. For bleeding, the Water Flosser was 26% better than flossing and 53% better than brushing alone.

Conclusion
Adding a Waterpik® Water Flosser with the Orthodontic Tip to manual toothbrushing is significantly more effective at improving oral health in adolescent orthodontic patients than adding manual floss or brushing only.
Waterpik® Water Flosser: More Than 2X As Effective As String Floss For Implant Patients.

Comparison of the Effect of Two Interdental Cleaning Devices Around Implants on the Reduction of Bleeding: A 30-day Randomized Clinical Trial

Magnuson B, Harsono M, Stark PC, et al. Compend Contin Ed Dent 2013; 34(Special Issue 8):2-7. Study conducted at Tufts University, School of Dental Medicine, Boston, Massachusetts.

**Objective**
To compare the efficacy of a Waterpik® Water Flosser to string floss for implant patients.

**Methods**
Subjects were randomized into two groups; Group 1 used a manual toothbrush and a Waterpik® Water Flosser with the Plaque Seeker® Tip (WF) and Group 2 used a manual toothbrush and string floss (SF). There were 22 implants in each group and the primary outcome was the reduction in the incidence of bleeding on probing. Subjects brushed twice a day and used either the WF or SF once a day.

**Results**
There were no differences between the groups at baseline. At 30 days, 18 of the 22 (81.8%) implants in the WF group showed a significant reduction in BOP compared to 6 of the 18 (33.3%) from the floss group. The WF group experienced 145% better reduction in gingival bleeding around implants vs. the string floss group (p=0.0018).

**Conclusion**
The Waterpik® Water Flosser is significantly more effective than string floss for improving gingival health around implants and is safe to use.
Waterpik® Water Flossers Significantly Reduce Plaque Biofilm, Gingivitis, and Bleeding for Patients with Diabetes

Comparative Evaluation of Adjunctive Oral Irrigation in Diabetes


Objective
To compare the addition of the Waterpik® Water Flosser with the Pik Pocket™ subgingival irrigation tip to routine oral hygiene on the periodontal health of people with diabetes.

Methodology
52 subjects with periodontal disease and either type 1 or type 2 diabetes participated in this 3-month randomized clinical trial. All subjects had scaling and root planing at baseline then were assigned to either add a Waterpik® Water Flosser with the Pik Pocket™ Tip twice daily to their oral hygiene routine or to continue practicing their regular oral hygiene routine. Periodontal health was measured via clinical and metabolic parameters.

Results
Adding the Waterpik® Water Flosser was superior to normal oral hygiene in reducing the traditional measures of periodontal disease: plaque biofilm, gingivitis, and bleeding on probing. The Water Flosser also reduced the serum levels of pro-inflammatory cytokines IL-1β and PGE$_2$, as well as the level of reactive oxygen species, a bacteria and host-mediated pathway for tissue destruction implicated in the pathogenesis of over 100 conditions.

Conclusion
The Waterpik® Water Flosser provides significant periodontal health benefits, both clinically and biologically to people with diabetes.
Waterpik® Water Flossers Significantly Reduce Plaque Biofilm, Gingivitis, Bleeding, and Pocket Depth in Periodontal Patients

Clinical Benefits of oral irrigation for periodontitis are related to reduction of pro-inflammatory cytokine levels and plaque.


Objective
To determine the impact of the Waterpik® Water Flosser as an adjunct to routine oral hygiene on clinical signs of periodontitis and on the levels of cytokines in the gingival crevicular fluid.

Methodology
Fifty-two subjects with mild to moderate periodontitis participated in this single center, blinded study. The clinical signs of periodontal disease were evaluated via plaque biofilm, gingivitis, and bleeding indices and probing depth. The cytokines measured were IL-1ß, PGE₂, IL-10, and INF-γ. Data was collected at baseline and 14 days.

Results
The addition of the Waterpik® Water Flosser to routine oral hygiene resulted in statistically significant reductions in plaque biofilm, gingivitis, bleeding on probing, and probing pocket depth. The Waterpik® Water Flosser produced a host modulation effect by reducing IL-1ß and PGE₂, cytokines associated with bone and attachment loss, raising IL-10, an anti-inflammatory agent, and stabilizing INF-γ, a bacteria-killing cytokine.

Conclusion
Adding the Waterpik® Water Flosser to routine oral hygiene inhibits periodontal disease activity and significantly improves periodontal health.
The Waterpik® Water Flosser: An Effective Alternative to Subgingival Antibiotic Treatment for Periodontal Maintenance Patients

Periodontal Maintenance Following Scaling and Root Planing, Comparing Minocycline Treatment to Daily Oral Irrigation with Water

Genovesi AM, Lorenzi C, Lyle DM et al. Minerva Stomatol 2013; 62(Suppl. 1 to NO. 12):1-9. Study conducted at the Tuscan Stomatologic Institute, Department of Dentistry, Versilia General Hospital, Lido di Camaiore (LU), Italy

Objective
Assess the efficacy of daily Water Flossing in comparison to subgingival minocycline treatment for subjects with moderate to severe periodontitis.

Methodology
In this single-center, parallel, single blind, randomized clinical study, thirty subjects with moderate to severe periodontitis were placed into a minocycline-treated group or a Water Flossing group. Scaling and root planing was carried out, and both groups received instruction on proper home-based oral hygiene. One group was administered minocycline inside their deepest periodontal pockets at the initial hygiene visit. The second group was instructed to use a Waterpik® Water Flosser once a day. Clinical and microbiological parameters were measured at baseline and repeated after 30 days.

Results
Both the Waterpik® Water Flosser and minocycline treatment groups experienced a significant reduction in all clinical parameters tested at 30 days. The Water Flosser group reduced bleeding 81% v. 76% for the minocycline group. Moreover, both procedures effectively reduced the typical parameters of periodontitis (bleeding on probing, pocket depth, and clinical attachment levels). Differences between the two therapies were not statistically significant for clinical parameters or bacterial suppression.

Conclusion
The Waterpik® Water Flosser is an effective alternative to subgingival antibiotics for periodontal maintenance patients over a 30 day period.
Waterpik® Complete Care: 70% More Effective than Sonicare® FlexCare for Reducing Gingival Bleeding

The Addition of a Water Flosser to Power Toothbrushing: Effect on Bleeding, Gingivitis, and Plaque


Objective
To compare the efficacy of Waterpik® Complete Care (Water Flosser and Sonic Toothbrush) vs. Sonicare® FlexCare on gingival bleeding, gingivitis and plaque removal.

Methodology
One hundred and forty subjects were enrolled in this 4 week, randomized, single blind, clinical study. Subjects were assigned to one of four groups: Group 1 used a Waterpik® Complete Care — combination Water Flosser and Sonic Toothbrush, Group 2 used a Waterpik® Sonic Toothbrush only, Group 3 used a Sonicare® FlexCare only, and Group 4 used an ADA standard manual toothbrush. Bleeding on Probing (BOP), Modified Gingival Index (MGI) and Rustogi Modified Navy Plaque Index (RMNPI) were measured at 14 days and 28 days.

Results
At 4 weeks, Waterpik® Complete Care was significantly more effective than Sonicare® FlexCare on all measures; 70% better for gingival bleeding, 48% better for gingivitis, and 52% better for plaque removal. At 4 weeks, Waterpik® Complete Care was also significantly more effective than a manual toothbrush on all measures; 159% better for gingival bleeding; 135% better for gingivitis, and 134% better for plaque removal.

Conclusion
The Waterpik® Complete Care regimen is up to 70% more effective than Sonicare® FlexCare and up to 159% more effective than a manual toothbrush for improving gingival health.
**Waterpik® Sensonic® Professional Plus Toothbrush: 29% More Effective than Sonicare® FlexCare for Improving Oral Health**

Comparison of Two Sonic Toothbrushes for the Reduction of Plaque, Bleeding and Gingivitis


**Objective**
To compare the use of a Waterpik® Sensonic® Professional Plus to Sonicare® FlexCare toothbrush for the reduction of plaque and inflammation over a 4 week period.

**Methodology**
One hundred and five subjects were randomized into one of three brushing groups: Waterpik® Sensonic® Professional Plus toothbrush, Sonicare® FlexCare toothbrush or an ADA standard manual toothbrush. During this randomized, single blind, clinical study, subjects were evaluated at baseline, 2 weeks and 4 weeks for plaque, bleeding and gingivitis. Subjects were instructed on the proper use of their assigned power device based on manufacturer’s instructions. Manual toothbrush users continued with their normal brushing technique. All subjects used the assigned ADA fluoridated toothpaste and brushed twice a day. Modified Gingival Index (MGI) and Bleeding on Probing (BOP) scores were recorded for whole mouth, facial and lingual. Plaque scores were recorded for whole mouth, facial, lingual, marginal and approximal using the Rustogi Modified Navy Plaque Index (RMNPI).

**Results**
At 4 weeks the Waterpik® Sensonic® Professional Plus was 29% more effective than Sonicare® FlexCare for plaque removal. And also significantly more effective for reducing gingival bleeding and gingivitis. The Sensonic® Professional Plus was also more effective than the manual toothbrush for all areas and regions measured.

**Conclusion**
The Waterpik® Sensonic® Professional Plus is significantly more effective than Sonicare® FlexCare for removing plaque and improving oral health.
Waterpik® Sensonic® Professional Toothbrush Removes Significantly More Plaque than Other Sonic Toothbrushes

Evaluation of the Plaque Removal Efficacy of Three Power Toothbrushes


Objective
To compare plaque removal ability of the Waterpik® Sensonic® Professional Toothbrush to the Sonicare® Elite, Oral-B® Sonic Complete and a manual toothbrush.

Methodology
145 subjects participated in this single use, single blind study. Subjects abstained from brushing for 23-25 hours prior to pre-brushing data collection. Post-brushing scores were obtained after a two-minute supervised brushing with the assigned toothbrush. Whole mouth, marginal, and approximal plaque scores were obtained.

Results
The Waterpik® Sensonic® Professional Toothbrush provided significantly better reductions in plaque for whole mouth and marginal areas over the other three brushes. The Sensonic® Professional Toothbrush was better than the Sonicare® Elite and manual brush and statistically similar to the Oral-B® Complete for approximal plaque removal.

Conclusion
The Waterpik® Sensonic® Professional Toothbrush removes significantly more plaque than the Sonicare® Elite, Oral-B® Complete and a manual toothbrush.
Research Bibliography


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