Santos S, Lang T, Gaengler P, Stewart B. Interdental Removal of Simulated Plaque with an Expanding Black Mint Dental Floss Compared to Traditional Floss. 2020 ADHA Virtual Conference Poster Presentation Abstracts. J Dent Hyg 2020; 94(5):53.

Objectives: Interdental plaque removal plays an important role in preventing dental diseases. Systematic reviews suggest that long-term evidence for interdental cleaning benefits is weak. This ex vivo model examined interdental tooth surfaces that can be reached with dental floss but is not clinically visible. The purpose of this study was to use a laboratory model to assess the plaque removal potential of an innovative expanding charcoal-infused floss compared to unwaxed string floss.

Methodology: Using organic plaque simulation and computer-assisted planimetrical assessment, plaque removal efficacy was evaluated at 12 interdental coronal and root risk fields by BURST Expanding Black Mint Eucalyptus Floss [BEF (BURST, USA)] and by Oral-B® Glide® Pro-Health Original Floss [OBGF (Procter & Gamble, USA)]. Typodonts with 10 artificial teeth were dipped into red-disclosed artificial plaque solution. Plaque was allowed to dry; a single technician flossed the teeth while situated in the model, passing three manual strokes per interdental tooth space through the contact point; one straight perpendicular, two angled 25° mesially and distally, representing c-shape action of standard flossing. This procedure was performed seven times for each floss product on different typodonts. Percentage of plaque removal was documented and analyzed for mesial and distal coronal tooth surfaces (above and below contact point, at contact point), mesial and distal, buccal and lingual approximal surfaces (adjacent interdental space) and mesial and distal root surface risk fields just below the cementoenamel junction. See Figure 1. Data were analyzed using independent, two sample t-test to assess whether the means of the two floss products are statistically significantly different, α=0.05.

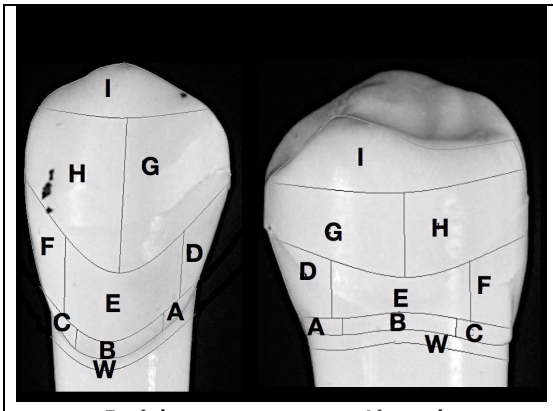
Results: Based on planimetric analysis of plaque removal, both floss products performed well in removing plaque from the interdental risk areas (See Table 1).

- Compared to OBGF, BEF exhibited the best plaque removal efficacy with up to 85% removal on surfaces between teeth (contact areas), $p<0.001$.
- For root surfaces just below the cementoenamel junction, BEF reduced plaque by up to 58% compared to OBGF which reduced plaque by 23% in the same risk field, $p<0.001$.
- BEF removed 2 times more plaque than a regular unwaxed dental floss (Oral-B Glide Pro-Health Original Floss) for deeper cleaning (root surfaces) just below the gumline.
- Laboratory assessment reveals that the interdental cleaning efficiency of BURST floss is greater than Oral-B Glide Pro-Health Original Floss.

Conclusions: This ex-vivo test methodology demonstrated the potential of two string floss products to effectively remove plaque from interdental areas that are not

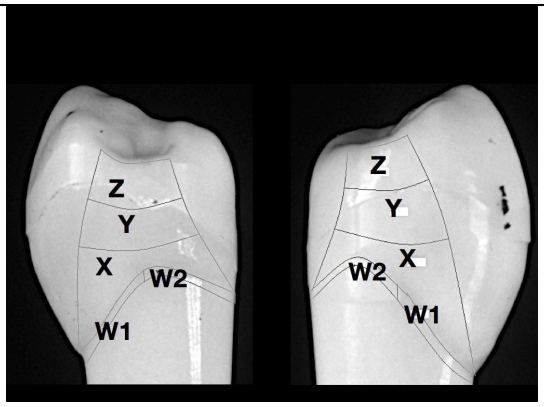
clinically visible and cannot be measured in a clinical trial. The interdental planimetric plaque control was superior for BURST Expanding Black Mint Eucalyptus Floss compared to Oral-B Glide Pro-Health Original Floss

Figure 1 Tooth surfaces assessed for plaque



Facial **Lingual**

Surface areas on the crowns of the teeth that can be reached by floss include the **D & F** surfaces on the facial and lingual.



Surfaces not accessible by toothbrush:
W1 and W2 are interproximal surfaces of the teeth at or just below the CEJ.
X, Y and Z surfaces are interproximal on the crown of each tooth.

TABLE 1. PER CENT PLAQUE REMOVAL OF FLOSS PRODUCTS

Device	Tooth surface	Mean	Std Dev	Mean Diff. vs. Glide
BURST Charcoal	Mesial (XYZ)	85.02	1.78	13.80**
	Distal (XYZ)	75.56	1.59	13.61**
	DF Buccally	22.24	5.70	7.99*
	DF Lingually	32.57	3.92	15.65**
	W1W2 Mesially	58.33	8.31	34.96**
	W1W2 Distally	49.54	7.32	34.46**
	Total Interprox (XYZ + W1W2)	67.11	3.68	24.21**
	Total (all surfaces)	54.97	2.36	21.17**
Oral-B	Mesial (XYZ)	71.22	3.53	
	Distal (XYZ)	61.95	3.23	
	DF Buccally	14.25	4.36	
	DF Lingually	16.92	3.20	
	W1W2 Mesially	23.36	8.04	
	W1W2 Distally	15.08	5.24	
	Total Interprox (XYZ + W1W2)	42.90	3.39	
	Total (all surfaces)	33.80	2.67	

* $p < 0.05$
** $p < 0.001$