
Caries Development in Primary Tooth Enamel following APF Foam Application: Polarized Light Microscopic Study.
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This *in vitro* study compared the effect of APF Foam treatment on caries development in primary tooth enamel. 10 caries-free exfoliated or extracted primary teeth underwent a fluoride-free prophylaxis and were sectioned into tooth portions. Each tooth portion with 2 sound enamel windows were assigned to a treatment group: 1] Control-no APF treatment; 2] Oral-B APF Foam for 60s; 3] Sultan APF Foam for 60s, 4) Butler APF Foam for 60s, 5) Biotrol APF Foam for 60s. After a 24h deionized-distilled water rinse, the tooth portions were exposed to an artificial caries medium (dialyzed gel: 1.0mM Ca, 0.6mM PO₄, 0.05mM Fl, pH 4.75). After caries development, longitudinal sections (5 sections/specimen) were obtained to determine mean lesion depths (polarized light, water imbibition). Mean lesion depths (\pm sd) were compared among the control and APF Foam groups (ANOVA, DMR).

	Control-no APF	Oral-B	Sultan	Butler	Biotrol
Mean Lesion	307 \pm 28um*	205 \pm 31um	189 \pm 19um	221 \pm 36um	197 \pm 23um

Depth
(*P<.05 control vs Oral-B, Sultan, Butler, Biotrol)

Mean lesion depths were reduced by 28% (Butler) to 38% (Sultan) following a single 60 second treatment with APF Foam, compared with untreated paired enamel surfaces (P<.05). Within the APF Foam groups, mean lesion depths were not found to be significantly different (P>.05). APF Foam from a variety of manufacturers provided similar degrees of caries protection for primary tooth enamel. This relatively short treatment time with a topical fluoride agent containing a lower concentration of fluoride than typical APF gels may be particularly beneficial for caries prevention in young children. Supported by AAPD Foundation Grant