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Digital Plaque Imaging Reproducibility in Hygiene and Chemotherapeutic Response

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Digital imaging techniques provide a unique tool for assessing efficacy of hygiene and antiseptic technologies for the therapeutic control of dental plaque (Sagel et al., Monographs in Oral Science 17; 2000). Objective DPIA protocols offer the potential for assessments of chemotherapeutic efficacy in diverse populations without variability associated with subjective indices and clinician applied categorical indices. **Objectives:** This study compared the effects of brushing hygiene and chemotherapeutic mouthrinse use in two separate clinical populations. **Methods:** Qualified DPIA panels in Egham, UK (E), and Cincinnati, Ohio-USA (C) were subjected to clinical protocols including standardized plaque level acclimatization using a manual toothbrush and fluoride dentifrice. In the intervention phase of trials, essential oil mouthrinse use was added to standard toothbrushing bid following commercial label instructions. Plaque coverage on the dentition was evaluated as % tooth coverage on imaged teeth evaluated pre hygiene a.m., post hygiene a.m. and in the p.m. Plaque coverage on teeth was determined from quantitative decision rules based upon objective color classifications of imaged pixels. The E and C sites used standard lighting and UV illuminations respectively to disclose dye. **Results:** Plaque removal averaged 40-50 % for hygiene in all studies. Plaque reductions for essential oil rinse measured 52 % C; 44 % E (both statistically significant $p < 0.05$). The similar numerical plaque response in the DPIA clinical protocol is in contrast to reviewed literature where large discrepancies are seen in subjectively evaluated clinical performance of hygiene and preventive measures. **Conclusion: Objective plaque assessments offer the potential for quantitative estimates of population epidemiology, hygiene efficiency and chemotherapeutic efficacy without complications due to interpretation or application of subjective clinical indices. Illumination conditions did not influence comparative efficacy of hygiene or chemotherapeutic measures once proper classification rules were established.**

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Bioavailability of Cetylpyridinium Chloride Formulations and Plaque Control

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CPC has a long lasting history full of contradictions with regard to its clinical antimicrobial effectiveness. Its bioavailability in formulations is doubted as a possible result of interaction with formulation components in rinses and dentifrices or deactivation on oral tissues. **Objective:** This study assesses the bioavailability of three CPC containing formulations from the alterations brought by these formulations in chemical composition of pellicles and detachment of co-adhering oral bacteria in vitro. **Methods:** Enamel blocks were coated with a 16 h salivary pellicle followed by a 30 s CPC treatment originating from: Scope (SM), Viadent (VM) or Crest Pro-Health (CPH, no alcohol added). Subsequently, the blocks were again coated with a 3 h pellicle and water contact angles (WCA) and chemical composition were measured. Detachment by the CPC rinses of a co-adhering bacterial pair was studied in the parallel plate flow chamber on a 16 h pellicle coated surface. After detachment by rinsing with a CPC formulation, re-deposition was initiated by flowing with a fresh streptococcal suspension. **Results:** CPH made the pellicle (WCA 45°) significantly ($p < 0.05$) more hydrophobic (WCA 60°), whereas VM and SM left the pellicle hydrophobicity unchanged (WCA 47° and 56°, respectively). Pellicle formation on CPC treated pellicles showed differences in surface hydrophobicity depending on the formulation used and in line with the percentage oxygen observed in XPS. SM detached only 15% of the co-adhering pair whereas CPH and VM detached 27% and 32%, respectively. Bacterial re-deposition was not significantly ($p > 0.1$) different for the three different formulations. **Conclusion: CPH had the most pronounced effect on pellicle physico-surface chemistry, likely attesting to its bioavailability which is proven in clinical plaque and gingivitis studies.**