**2329**

## *A Digital Image Analysis Technique for Assessing Gingivitis (DIAG)*

J.M. Miller*, K.S. Howard-Nordan, R.J. Sunberg, R.P. Block, C.L. Poore, D.P. Stevens
Procter & Gamble, Cincinnati, OH, USA

Gingival assessments are traditionally based on examiner interpretations of gingival inflammation and, as a result, are subjective in nature. The use of digital imaging technology in clinical assessments has inherent advantages including enhanced objectivity, improved examiner/patient safety, and an ability to store images for future analyses. The objective of this clinical study was to assess the feasibility of using a computerized digital image analysis technique to assess gingivitis (DIAG). Forty two systemically healthy subjects, representing a wide range of disease, were enrolled. Subjects first had two images of their gingiva (anterial facial and one lateral view) digitally captured, and then received a whole mouth examination using the Mandel-Chilton modification of the Löe-Silness Gingival Index (L-S GI). Afterwards, the images were analyzed using DIAG to yield seven measures of gingivitis. These included two that measured the area (% and square mm) of inflamed gingiva using a discriminant analysis technique and five that measured the color of the gingiva (using L*, a*, and b* color values) for bands both adjacent to and at a specified distance from the teeth. Spearman's correlations between each DIAG measure and the L-S GI were calculated. Additionally, the standard deviation of subject scores was calculated for each gingivitis measure and expressed as a percent of the overall mean (%RSD). The two DIAG area measures proved to have the highest correlation with the examiner (correlations ranging from 0.60 to 0.71, p-values < 0.0001). For the L* and a* color values for bands adjacent to the teeth, the correlations ranged from 0.40 to 0.62 (p-values < 0.0092). The %RSDs for L-S GI ranged from 69 to 78%. For the DIAG L* and a* color values for bands adjacent to the teeth and the DIAG area measures, the %RSDs were approximately 1/10 and 1/2 as large, respectively. **These results suggest that it is feasible to use the reported DIAG measures to assess gingivitis in humans and that future evaluation is justified.**

**3080**

## *Clinical Reversal of Caries with Sodium and Stannous Fluoride Dentifrices*

S.F. McClanahan*, A.R. Biesbrock, R.V. Faller, R.D. Bartizek, L.K. Court
Procter & Gamble, Cincinnati, OH, USA

Experimental evidence has clearly demonstrated that the early stages of lesion formation (enamel demineralization) are reversible following exposure to saliva and/or fluoride. However, the literature is lacking with respect to data from well controlled, clinical studies regarding the quantitative contribution of remineralization to arrestment and reversal of caries. Retrospective analysis of an existing clinical trial database provided an opportunity to examine the incidence of clinical lesion reversals in a placebo controlled, double-blinded caries clinical study. The clinical study examined three treatment groups: 1) 0.243% sodium fluoride/silica (NaF) dentifrice, 2) 0.4% stannous fluoride/calcium pyrophosphate ($SnF_2$ positive control) dentifrice and 3) non-fluoridated placebo/calcium pyrophosphate (negative control) dentifrice. Clinical measures in this study included both radiographic and visual-tactile assessments of caries. Considering the combined visual-tactile and radiographic examination DMFS scores, the average number of clinical caries reversals from baseline per subject in the placebo and sodium fluoride groups was 1.04 vs. 1.38 at Year 3, respectively, with $p$ = 0.006. Considering radiographic lesions alone, the average number of reversals per subject in the placebo and sodium fluoride groups was 0.62 vs. 0.82 at Year 3, respectively, with $p$ = 0.008. In contrast, while caries reversals in the stannous fluoride group occurred with greater frequency than in the placebo group at Year 3, for both total and radiographic caries, the differences were not statistically significant. When only subjects who were "at risk" for potential reversals (i.e. those with a minimum of one caries lesion at baseline) were examined, a statistically greater frequency in caries reversals was observed in both the sodium fluoride (total, incipient, and radiographic caries) and stannous fluoride (total and radiographic caries) groups as compared to the placebo group at Year 3. **Collectively, these data confirm the ability of both 0.243% sodium fluoride/silica and 0.4% stannous fluoride/calcium pyrophosphate dentifrices to clinically reverse caries.**