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**Randomized Trial of Plaque Identifying Toothpaste: Dental Plaque Inflammation**

**Section D200**

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**Summary of article**

“Randomized Trial of Plaque Identifying Toothpaste: Dental Plaque and Inflammation”, was conducted by Kim Fasula, Carla A. Evans, Linda Boyd et al. This randomized control trial took place in Illinois and was funded by the University of Illinois College of Dentistry. It was published in the *American Journal of Medicine* in June of 2017 ([https://www.ncbi.nlm.nih.gov/pubmed/27771276).](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [The purpose of this randomized control trial was to test the effectiveness of reduction of dental plaque and high sensitivity C-reactive protein(hs-CRP) using plaque identifying toothpaste. There were 61 subjects aged 19 to 44 years old that were assigned at random to use the plaque identifying toothpaste for 60 days. The changes in dental plaque and hs-CRP were recorded and evaluated from the start and to follow up. This randomized control trial was approved by Institutional Review Board of the University of Illinois.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [In conclusion, the authors findings stated there the plaque identifying toothpaste produced "significant reductions in dental plaque and hs-CRP." The reduction in inflammation is an extraordinary finding that helps ensure lower risks of cardiovascular disease. If the trial was conducted with a larger sample size, the impact on major clinical and public health would be significant.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

[**Article Information**](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [The title of the article is "Randomized Trial of Plaque Identifying Toothpaste: Dental Plaque and Inflammation." The authors that were involved in this study are as follows: Kim Fasula, Carla A. Evans, Linda Boyd et al. It was published in the American Journal of Medicine in June of 2017 (https://www.ncbi/nlm.nih.gov/pubmed/27771276). The study sponsor involved in this trial was an investigator initiated research grant by TJA Health, LLC, which was in Joliet, Illinois and was given to the University of Illinois College of Dentistry. It was stated that the funding source did not have a role in the conduct, design, analysis, interpretation, preparation of the manuscript, or the decision of were to submit. There were no disclosures reported in this randomized control trial.](%09The%20title%20of%20the%20article%20is%20%22Randomized%20Trial%20of%20Plaque%20Identifying%20Toothpaste%3A%20Dental%20Plaque%20and%20Inflammation.%22%20The%20authors%20that%20were%20involved%20in%20this%20study%20are%20as%20follows%3A%20Kim%20Fasula%2C%20Carla%20A.%20Evans%2C%20Linda%20Boyd%20et%20al.%20It%20was%20published%20in%20the%20American%20Journal%20of%20Medicine%20in%20June%20of%202017%20%28https%3A//www.ncbi/nlm.nih.gov/pubmed/27771276%29.%20The%20study%20sponsor%20involved%20in%20this%20trial%20was%20an%20investigator%20initiated%20research%20grant%20by%20TJA%20Health%2C%20LLC%2C%20which%20was%20in%20Joliet%2C%20Illinois%20and%20was%20given%20to%20the%20University%20of%20Illinois%20College%20of%20Dentistry.%20It%20was%20stated%20that%20the%20funding%20source%20did%20not%20have%20a%20role%20in%20the%20conduct%2C%20design%2C%20analysis%2C%20interpretation%2C%20preparation%20of%20the%20manuscript%2C%20or%20the%20decision%20of%20were%20to%20submit.%20There%20were%20no%20disclosures%20reported%20in%20this%20randomized%20control%20trial.%20)

[**Study Analysis**](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [**Study Type:** The type of study that was conducted was a randomized control trial, which took place in the state of Illinois during the year of 2016. The subjects that were eligible to partake in this study were screened at the Illinois Medical District.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [**Study Purpose:** The purpose of this study was to test the reduction of dental plaque and hs-CRP using plaque identifying toothpaste. Prior to this study, there was only very minimal data about plaque identifying toothpaste and its effectives of reduction in dental plaque and hs-CRP. The lack of information about the reductions caused the creation of this randomized control trial and tests were conducted. The aim of this randomized control trial was to create beneficial and knowledgeable information regarding reductions using plaque identifying toothpaste. If the findings of reduction were found to be what was hypothesized, it would have positive implications in public health and in major clinics.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [**Experimental Designs:** The authors conducted this study by utilizing 61 subjects that were deemed healthy between the ages of 19 and 44 years old. Each subject signed consent forms and were assigned a plaque identifying toothpaste or placebo toothpaste (non-plaque identifying toothpaste) at random. The instructions given were to use the same brushing protocol for the entirety of the 60 days. In order for the authors to evaluate the changes, the subjects used a fluorescein mouth wash and intraoral photographs were taken under black light imaging. A digital plaque analysis of cropped images of the 12 maxillary and mandibular anterior teeth were observed using the two programs Adobe Photoshop CS5, and Matlab. Also, custom software was utilized to determine the mean plaque ratios using the following formula: (plaque pixels) / (plaque + teeth pixels) x100%. The changes in hs-CRP were assessed by Quest Laboratories in milligrams per liter using an enzyme linked immunosorbent assay. Means and mean ratios were taken for each treatment group at every time point. Due to dental plaque and hs-CRP being higher values, the outcomes of each group were tested on log-transformed data by using repeated measures analyses of variance with treatment, time and treatment. The tests for hs-CRP and plaque were conducted using the R version 3.3.1 and two-sided levels of 0.05.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [**Results:** The results revealed that out of 61 subjects, 31 were given this plaque identifying toothpaste. According to Table 1 that was provided with recordings, it showed no significant differences between the treatment groups in the baseline characteristics. This was in either the intention to treat analyses of dental plaque or pre-specified subgroup analyses of hs-CRP. In Table 2, it shows the arithmetic means and mean ratios of change from baseline for plaque and hs-CRP. Looking at the intention to treat analyses, the mean ratio for dental plaque of 0.51 shows a 49% reduction in the plaque identifying toothpaste group. But, in the placebo toothpaste group, the mean ratio for dental plaque of 0.76 shows a 24% decrease. These are significant differences statistically. For the intention to treat analysis, hs-CRP showed a decrease by 6% in the plaque identifying toothpaste group and had an increase by 81% in the placebo toothpaste group. This was not a statistically significant difference. In the pre-specified group, the average hs-CRP at baseline was recorded at 3.13 with the group using the plaque identifying toothpaste group and a 2.32 in the group using the placebo toothpaste. At follow up, the average hs-CRP was 2.22 in the plaque identifying toothpaste group and was 2.89 in the placebo group. The analyses had a mean ratio for hs-CRP of 0.71, which indicates a 29% decrease in the group utilizing the plaque identifying toothpaste, the mean ratio for hs-CRP in the placebo group was 1.25 and indicates a 25% increase. This difference was deemed statistically significant.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

 [**Conclusion:** The authors concluded that the plaque identifying toothpaste had significant reductions in dental plaque as well as hs-CRP. These findings help support the hypothesis of a reduction in risks of cardiovascular disease. Plaque buildup is a cause for caries and periodontal diseases. If plaque is not removed properly, it can cause tissue damage and a systemic inflammatory response. This inflammation can help progress cardiovascular diseases. These findings help support the hypothesis of a recently reported randomized control trial and strongly support that this plaque identifying toothpaste helps reduce risks of cardiovascular disease. The authors believe if this study was done at a larger scale and a sufficient size and duration, it would help dramatically for our future in public health.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)

**[Impression](https://www.ncbi.nlm.nih.gov/pubmed/27771276)**

 [I believe this study is significant and is beneficial to not only public health but specifically dental hygiene. These findings of risk reduction in cardiovascular disease by utilizing this plaque identifying toothpaste can create prevention that is much needed. Informing our patients, family and friends will only have positive implications. Knowing that it can help reduce the risk of cardiovascular disease and reduction in plaque, I can't help but wonder if it would be safe for children or elderly to use. The subjects that participated in this trial were ages of 19-44 and these results were not tested on children or even the elderly as well. Does it have the same impact on children and elderly people? Is it safe to use for both? I'd hope to learn more about this topic and look to see if any future tests will be done with a larger sample size to help support the hypothesis even further.](https://www.ncbi.nlm.nih.gov/pubmed/27771276)