

## All-Ceramic Update

Over the last several years the use of a monolithic IPS e.max® lithium disilicate restoration has rapidly increased. Clinicians, laboratories and researchers have suggested its use as an alternative to porcelain fused to metal due to its high durability. Though lithium disilicate is extremely resistant to fracture, it has been shown to also be kind to opposing dentition. The high wear compatibility of IPS e.max lithium disilicate with natural dentition has been demonstrated in several in-vitro studies both internally as well as through third parties. Recently, an in vivo study by Dr. Josephine Esquivel-Upshaw at the University of Florida investigated the wear rates experienced intra-orally with lithium disilicate. While the in-vitro studies show great wear compatibility from a material properties perspective, the in-vivo research validates the real life application of the product.

### ***In Vivo Analysis of Wear in Ceramic Crowns and Their Enamel Antagonists***

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Abstract #1009

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**Objectives:** To test the hypothesis that equivalent wear patterns exist in all directions for enamel versus enamel and all ceramic material (IPS e.max Press) versus enamel.

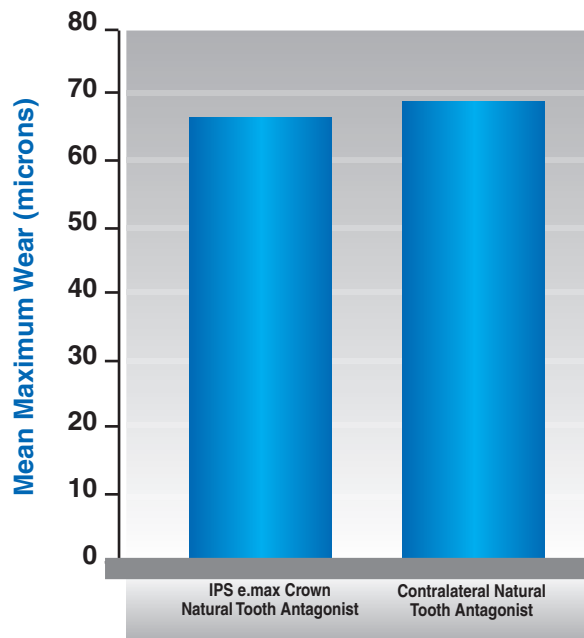
**Methods:** Conducted a randomized, controlled clinical trial to analyze the wear of enamel against three ceramic restoration materials. This single-blind pilot study involved a total of 31 patients (8 male, 23 female; age range 24-62 years) with 36 teeth that needed full coverage crowns opposing natural antagonist teeth. A vinyl polysiloxane impression was made of the maxillary and mandibular arches to record the occlusal surfaces of the cemented crown, its antagonist tooth, and its contralateral tooth, after one week, one year and two years, post cementation. Casts were produced in gypsum (GC Fujirock) and scanned using a 3D Laserscanner (Willytec, Germany).

Maximum wear was calculated by superimposing the baseline one-week image with first and second year images and measuring the reduction in tooth height on the occlusal surface in microns. Enamel vs. enamel wear of 38 µm (28 µm for steady state) for molars and 18 µm (15 µm for steady state) for premolars is considered to be normal.\*

**Results:** The mean maximum wear for the ceramic crowns was 41.1±4.57 µm after 2 years. The mean maximum wear rate for the natural enamel antagonists was 67.1±14.7 µm after 2 years. Teeth contralateral to the crowns exhibited a maximum wear of 35.3±6.81 after 2 years. In contrast, teeth contralateral to the crown antagonists (CCA) exhibited a maximum wear of 68.5±17.6.

**Conclusion:** This ceramic is promising as a long-term restorative material because its in vivo wear rates are within the range of normal enamel wear.

**Cumulative Two Year Clinical Wear Data with IPS e.max Press**



\* Lambrechts P, Braem, M., Vuylsteke-Wauters, M., Vanherle, G. Quantitative in vivo wear of human enamel. J Dent Res 1989 68:1752-4.