

**Approach for valuating the significance of laboratory simulation.**

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**OBJECTIVE:** The aim of this investigation was to compare the clinical survival rate of all-ceramic FPDs with failures during in vitro simulation. **METHODS:** 40 anterior FPDs were manufactured from lithiumdisilicate ceramic and alumina-oxide ceramic. The FPDs were adhesively bonded to human teeth and artificially aged to investigate the survival rate during thermal cycling and mechanical loading (TCML(1); 3.6 Mio\*50 N ML). Survival rates were compared to available clinical data, and the TCML parameter 'mastication force' was adapted accordingly for a second TCML run (TCML(2); 3.6 Mio\*25 N/35 N ML). The fracture resistance of the FPDs that survived TCML was determined. Data were statistically analysed by means of Mann-Whitney U-test, and survival rates were determined by curve fitting/regression analysis. **RESULTS:** TCML decreased survival rates by 30-50%, depending on the type of material used. Failures during TCML included cracking, chipping or fracture. Increased masticatory loading during TCML caused a higher decrease in the fracture resistance of FPDs. Fracture results were 403 N (278/453) and 426 N (317/538) for Empress 2 and 325 N (164/584) and 405 N (344/558 N) for Inceram. **CONCLUSIONS:** Despite the limitations of this study, the results indicate that TCML with 1,200,000\*25/35 N provide a sufficient prognosis of probable clinical failures. Longer TCML-time with higher mastication forces may help to exclude catastrophic clinical failures.

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