Bluestone Center for Clinical Research at the New York University College of Dentistry recently released results of several projects that evaluated the clinical efficacy and performance of the E4D Dentist System and compared the fit and strength of restorations produced by the E4D Dentist System with those from another chair side CAD CAM system.

In the clinical evaluation, the investigators reported that the E4D Dentist System was “…easy to learn by both experienced and inexperienced CAD CAM users. Restorations were captured (scanned), designed, milled, occlusion adjusted and inserted in an average of less than 45 minutes. 100% of all restorations created were found to be clinically acceptable by an independent examiner…”

In a separate in-vitro investigation, full coverage restorations of similar design were fabricated by the E4D Dentist System and the competitive system, seated onto composite dies using resin-based cements and then sectioned for fit analysis. The analysis showed that the E4D fabricated crowns exhibited a reduced and more homogeneous fit at all measured positions (buccal, lingual, and center). The results demonstrated a mean marginal fit of less than 20 microns, with an upper limit of 30 microns for E4D restorations and a mean marginal fit of 43 microns with an upper
limit of 68 microns for the competitive system.

According to the study - “The competitive system-produced specimens in this study fit least well at the center. Studies by our group (Silva NR, de Souza GM, Coelho PG, Stappert CF, Clark EA, Rekow ED, Thompson VP. Effect of water storage time and composite cement thickness on fatigue of a glass-ceramic trilayer system. J Biomed Mater Res B Appl Biomater.2008 Jan; 84(1): 117-23) suggest that increased cement thickness reduces the load required to initiate a radial crack in this area of the crown, potentially making crowns with less precise fit more vulnerable to fatigue failure.”

In a second in-vitro investigation, the mouth-motion fatigue reliability and failure modes of monolithic crowns (IPS Empress CAD, Ivoclar Vivadent) fabricated by the E4D Dentist System and a competitive system were evaluated. Results from the single load to failure provided a value of 1175 N for E4D and 1087 N for the competitive system. In the fatigue failure evaluation, no statistical difference was noted between the two systems.

The investigators conclude, “CAD CAM technology has been considerably improved in the past years.”

The authors of the reports are Van P Thompson, E Dianne Rekow, Mark Wolff, and Nelson RFA Silva. Scanning and fabrication of the specimens for the two systems were performed by different operators. Copies of the complete reports are available online at www.e4d.com under Resources.