

**Title:**

Evaluation of three different scanning techniques in full-arch implants digital impression using an intraoral scanners: a randomized controlled cross-over trial.

**AUTHORS:**

Di Fiore Adolfo(1), Meneghello Roberto(2), Graiff Lorenzo(1), Savio Gianpaolo(3), Turchetto Matteo(3), Stellini Edoardo(1).

**AFFILIATION:**

- 1) Departments of Neurosciences, University of Padova, Italy
- 2) Departments of Management and Engineering, University of Padova, Italy
- 3) Departments of Civil, Environmental and Architectural Engineering, University of Padova, Italy.

**Objective:**

Digital impression are becoming a common clinical practice, however a few information are available on the different techniques of scanning. The purpose was to compare three different techniques of scanning in a full-arch digital impression and to evaluate the time of scanning and learning curve of digital impression by inexperienced operators.

**Material and Methods:**

A zirconia model of an edentulous mandible with six scan-abutment was used as a master model and its dimensions measured with a coordinate measuring machine. Three different techniques of scanning (MetA; MetB and MetC) were applied on the master model with an intraoral scanner (Zfx GmbH). Nine students were divided in three groups. All students were instructed how to used the technique assigned. Each group knows only the scanning technique assigned. Each student performed 3 scans. All the digital impression were imported and analyzed with industrial reverse engineer software (Rhinoceros 5.0 Beta).3D Position and 3D Distance analysis were calculated to compare the three scanning techniques. The acquisition times (minutes) of each scan were recorded.

One-way analysis of variance with a post hoc analysis (Bonferroni's test ) was used to compare the three groups.

**Essential Results:**

The 3d position analysis showed that the accuracy of the three different scanning techniques have not statistically significant differences ( $p$  value = 0.386). The 3d distance analysis showed that the MetB had less distance errors dispersion.

**Conclusions:**

Scanning technique MetB is more appropriate respect the MetA and the MetB with this intra-oral scanner.