Implants are commonly used amongst dentists to replace teeth or address edentulous regions. The American Academy of Oral & Maxillofacial Radiology (AAOMR) recommend that cone beam computed tomography (CBCT) is used to assist in planning dental implants. CBCT provides:
- Cross-sectional imaging
- 3D volumetric measurements (alveolar ridge height & width)
These 3D cross-sectional images provide a method for dentists to project the length & width of potential implants. This study was conducted in order to evaluate the accuracy of CBCT measurements to corresponding implants that were placed.

### Methods

- Retrospective case-control study.
- Data was taken from 2017-2022, from 9 locations: Ross Hall and 8 ECU SoDM CSLCs.
- Compared CBCT scan measurements & implants sizes from 4 sites: Central incisor, Canine, 1st premolar, and 1st molar (Maxillary and Mandibular)
- # of implants cases analyzed: N = 544
  - Females: N = 288
  - Age range: 19-86 years old (Peak age of 61-70)
- One-way analysis of variance determined the average sizes for alveolar ridges/implants.
- Pearson correlation analysis determined the accuracy of CBCT based implant treatment planning.

### Results

- On average, implants had diameters of 4.17 ± 0.38 mm & lengths of 10.37 ± 1.01 mm.
- Alveolar widths & heights were 3.74mm & 4.31mm larger than implant diameters & lengths.
- Implants placed at the mandibular 1st molar, maxillary 1st premolar, and mandibular canine demonstrated significant correlations with sizes of edentulous regions. (P< 0.05).

### Conclusions

Generally, CBCT based alveolar ridge measurements have been demonstrated as a reliable index to predict future implant sizes. However, its accuracy may be limited by anatomic factors, such as edentulous ridges and proximity to vital anatomic landmarks.

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