



Newsletter 2: Oct/Nov 2009

The Advantages of Cone Beam CT over Helical CT

The use of cone beam CT in clinical practice provides a number of potential advantages for dental and maxillofacial imaging compared with conventional CT:

- **X-ray beam limitation:** The Accutomo 170 is capable of reducing the size of the irradiated area by collimating the primary x-ray beam to the area of interest. This therefore minimizes the radiation dose to the patient. We are capable of scanning small regions for a specific diagnostic task such as evaluation of a single tooth or implant site. Alternatively we can open the field of view to scan the entire facial area if required.

- **Image accuracy:** The data set obtained in a CT scan contains a 3D block of cuboid structures, known as voxels, which each represent a certain degree of x-ray absorption. The size of these voxels determines the resolution of the image. In conventional CT, the voxels are rectangular, and the longest dimension of the voxel is the axial slice thickness determined by slice pitch, a function of gantry motion. Although CT voxel surfaces can be as small as 0.625 mm square, their depth is usually in the order of 162 mm. Our cone beam CT unit provides voxel resolutions that are equal in all 3 dimensions. This produces sub-millimetre resolution as low as 0.125 mm, which exceeds that of the highest grade multi-slice CT.

- **Dose reduction:** Published reports indicate that the effective dose of radiation for a cone beam CT is significantly reduced by up to 98% compared with helical CT systems. This reduces the effective patient dose to approximately the same as a periapical survey of the dentition or 3615 times that of a single OPG.

- **Reduced image artifact:** With manufacturers' artefact suppression algorithms and increasing number of projections, Accutomo images result in much less metal artifact, particularly in reconstructed images of the teeth.