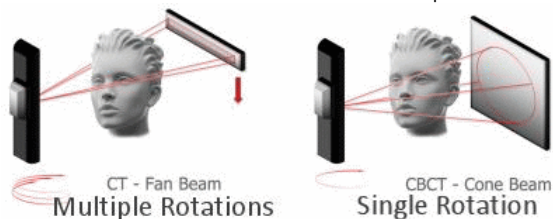


Truths and Myths about Dental Cone Beam

For the past decade, some dental offices have changed their view of radiography, literally. Cone Beam Computerized Tomography (CBCT) scanners presented the opportunity to obtain a 3-dimensional view of the mouth, that improved diagnosis, facilitated treatment planning and enhanced opportunities for patient education. Before in-office CBCTs became available, many patients who needed 3-D scans were referred out to hospital or imaging centers to obtain medical CTs. This was not only inconvenient and time consuming, but also exposed dental patients to more radiation than was necessary for dental treatment. Recently, articles have appeared cautioning the public about the increased health risks from medical CT scans. While it is worthwhile to take precautions to avoid exposure to unnecessary radiation, it is also important to avoid confusing radiation exposure statistics of medical CTs with those of dental CBCT scans.

Doctors and dentists ascribe to a protocol dubbed **"ALARA"** an acronym that stands for *As Low As Reasonably Achievable*, to establish safe radiation levels for patients, while collecting the most detailed information on their patients. Before even picking up a scalpel, with a Cone Beam scan doctors can determine bone structure and tooth orientation, view nerve canals, and pathology; and as a result, sometimes avoid the exploratory surgery needed to determine certain conditions that exist under the gum tissues. For some specialists such as implantologists, having access to information such as density, precise width and depth of bone and exact tooth locations, can mean the difference between the success and failure of the implant.



The Cone Beam scan differs from a medical CT in the method of image capture and in radiation exposure. The dental CBCT scan is captured in one single rotation around the patient. The beam is Cone-shaped, rather than the medical CT, which has a fan-shaped beam. For a medical CT, the machine travels in several revolutions around the patient's head, overlapping some radiation in the process of gathering its data. "The dental scan exposes the patient to up to 10 times less radiation than conventional medical CT scans," says W. Bruce Howerton, an oral and maxillofacial radiologist. He cites that radiation exposure using the standard full field of view from an i-CAT ® CBCT (Imaging Sciences International) is 36 microsieverts, compared to an average medical CT scan of the oral-maxillofacial area that can reach levels of 180 to 2100 microsieverts. (A microsievert is an international unit used to measure effective dosages of radiation.) Radiation levels can be lowered even more by utilizing different fields of view—or collimating, depending upon the machine. Dr. Howerton adds that a typical 2D full mouth series runs 150 microsieverts while a 2D digital panoramic image ranges between 4.7-14.9 microsieverts.

Besides preparing the dentist for a safer, less invasive, and more successful surgery, a 3-D scan also provides for increased confidence during the procedure. Software compatibility with these Cone Beam scanners allows for the use of surgical guides that steer dentists in the right direction during implant placement, and also for CAD applications for robotic archwires in orthodontics.

Whether a dentist invests in a CBCT machine for his/her own practice, or refers patients to a colleague or imaging center with CBCT capability, this imaging method really adds new dimension to the art of dentistry. Dr. Howerton notes that using CBCT scans provide knowledge to the dentist, in a responsible way, providing patients with optimum dental care in the safest way possible.

Contributed by [Imaging Sciences International](#)

The author, **Mali Schantz-Feld** has over 20 years experience in researching and writing about the medical and dental industries. She is a long-standing member of the Medical Writers Association.

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