Before a practitioner performs surgery, he or she should be equipped with up-to-date knowledge regarding the possible conditions located under soft tissue within the oral cavity.

Three-dimensional data generated by cone-beam computed tomography (CBCT) technology offers a “surgical view” or slices of the entire field of view from the front, side and under the patient. Cone-beam scans assist with determining bone structure, tooth orientation, nerve canals and pathology; in some cases it may preclude the necessity for a surgical procedure.

In the past few weeks, various media sources have published articles regarding high exposure of radiation from medical CT scans. Unfortunately, these have generated misconceptions about the dental CBCT, or 3-D cone-beam computed tomography scans.

The dental CBCT imaging method allows dentists to obtain vital three-dimensional information without exposing patients to high levels of radiation that come from medical CT scans. An in-office imaging method is more convenient; it saves the patient travel time to and from the hospital and for follow-up examinations after treatment.

Dentists and other medical professionals ascribe to the ALARA (as low as reasonably achievable) protocol concerning radiation levels. This protocol guides practitioners to expose patients to the least amount of radiation possible while still gaining the most pertinent information for proper diagnosis.

For example, for dentists placing implants, having this information beforehand is imperative to determining anatomical variations that can affect the procedure’s success or failure.

The differences between dental and hospital scans derive, in part, from the method of capturing the information. The average medical CT scan of the oral and maxillofacial area can reach levels of 1,200-3,300 microsieverts, the measurement of radiation absorbed by the body’s tissue. These significant levels are attributed to the method of exposing tissues to radiation. With the hospital scan, the anatomy is exposed in small fan-shaped or flat slices, as the machine makes multiple revolutions around the patient’s head.

To collect adequate formation, there is overlapping of radiation. In contrast, the dental scan captures all the anatomy in a single cone-shaped beam rotation, decreasing the exposure to the patient of up to 10 times less radiation.

For example, radiation exposure using the standard full field of view from an i-CAT® CBCT machine (Imaging Sciences International) is 36 microsieverts. These machines are also available in different fields of view, thereby reducing radiation exposure even more, depending upon the needs of the patient.

For other comparisons of exposure, consider that a typical 2-D full mouth series runs 150 microsieverts while a 2-D digital panoramic image ranges between 4.7-14.9 microsieverts.