

Cone Beam CT in Dentistry: Responsibilities of Dental Practitioner

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Introduction

Cone beam computed tomography (CBCT) was first introduced in the imaging of dental and maxillofacial region in 1997 and has been a major advancement in the imaging technologies available to the dental profession. It is now being widely used to obtain three dimensional information in complex cases such as impacted teeth, implant placement, temporomandibular joint disorders, complex endodontic cases, cleft palate, orthodontic and orthognathic surgery and evaluation of bony pathosis.

Individualized Approach for Ordering CBCT

CBCT imaging involves exposure of the patient to ionizing radiation. Thus, these examinations should be performed only for valid diagnostic or treatment reasons and with the minimum exposure necessary for adequate image quality [1]. Selection of CBCT should be based on the individual patient's history and a clinical examination. The 'routine' use of CBCT on patients based on a generalized approach rather than individual prescription is unacceptable [2].

Radiation safety and quality control

Practitioners who operate a CBCT unit, or request CBCT imaging, should have thorough understanding of the indications for CBCT, the operating parameters of the CBCT system and the effects of these parameters on image quality and radiation safety. The CBCT operator should also perform calibration and the regular quality control testing. Facilities operating CBCT should have specific policies and procedures for dose optimization. These include, but are not limited to, custom examination exposure protocols taking into account patient body size, field limitation to the region of interest, and use of personal protective devices such as a lead apron and, where appropriate, a thyroid collar.

Procedures should follow all pertaining regulations. The purpose of a quality control program is to minimize radiation risk to the patient, personnel, and public, while sustaining adequacy of the diagnostic information obtained. The dental practitioner is responsible for the development of the program [1].

Liability of Imaging Findings

The practitioner who operates a CBCT unit, or requests a CBCT study, must examine the entire image dataset. This requires a thorough knowledge of CT anatomy for the entire acquired image volume, anatomic variations, and observation of abnormalities. It is necessary that all image data be systematically reviewed for disease. The field of view can include intracranial structures, the base of the skull, the paranasal sinuses, the cervical spine, the neck, and the airway spaces. It is the responsibility of the practitioner obtaining the CBCT images to interpret the findings of the examination. Just as a pathology report accompanies a biopsy, an imaging report must accompany a CBCT scan. Any questions by the practitioner regarding image data interpretation should promptly be referred to a specialist in oral and maxillofacial radiology. Qualified specialist oral and maxillofacial radiologists may be able to assist diagnostically when practitioners are unwilling to accept the responsibility to review the whole exposed tissue volume [1].

References

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