Importance of DICOM in the Field of Dentistry

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Description

Dental caries, oral pathology, pre-surgical and pre-orthodontic therapy assessments are all becoming more common with the use of digital imaging. With the emerging techniques of digital imaging, a software approach that permits the transfer of patient, diagnostic, and other acquisition data, as well as imaging data, has become necessary. The Digital Imaging and Communication in Medicine (DICOM) standard governs how medical imaging data is handled, stored, printed, and transmitted. A DICOM file comprises a patient's X-ray image or sequence of images, as well as other patient-related information (e.g., patient name, identification number, acquisition mode) chosen from a standardised terminology library. The DICOM library is enormous, and it is updated on a regular basis to retain with the changing identification requirements. To provide secure electronic communication over the internet, DICOM files are fully encrypted. Intra-oral radiography, panoramic radiography, cephalometric radiography, skull and sinus radiography, tomography, CT, CBCT, MRI, PET, nuclear medicine, intra-oral photography/video, and microscopy (surgical and histological) are all examples of digital images.

Types of X-rays

There are different types of dental X-rays, each recording a slightly different perspective of your mouth. A few of them are most common like bitewing, occlusal, panoramic, periapical, and extra-oral X-rays. Bitewing is the method involves biting down on a particular piece of paper so that your dentist can assess how well your teeth's crowns match up, which is a standard method for detecting cavities between teeth (interdental). Occlusal is an X-ray taken when your jaw is closed in order to see how the upper and lower teeth line up. The floor of the mouth and the palate can also be helpful to detect anatomical abnormalities. This method captures all of your teeth in a single picture. A Panoramic is a form of X-ray in which the machine spins around the head. This method may be used by your dentist to examine your wisdom teeth, or to arrange for implanted dental equipment, or to study jaw issues. Periapical is the method that concentrates on two teeth that are completely restored from root to crown. Extra-oral X-rays may be used when the dentist suspects abnormalities in places other than the gums and teeth such as the jaw.

The American college of radiology and the national electrical manufacturers association were the first to develop DICOM standards. These standards are updated on a regular basis to improve electronic record compatibility and clinical workflow in the medical environment. The images and related data can be accessed in a standardised format regardless of the proprietary acquisition modality which is used to take the imaging study, allowing for cross-vendor interoperability or connectivity. Dentists can also use HIPAA-compliant internet connections to interact with their medical colleagues.

Since 1996, when the American Dental Association (ADA) joined the DICOM committee, dentistry has been actively involved in the development of DICOM standards. As a result, DICOM standards began to include picture object definitions with intraoral projections and colour photography that has been receiving significant attention. Most imaging device manufacturers (also known as acquisition modalities) now feature DICOM image identification in their products. To enable the storing, retrieval, and viewing of digital DICOM images, a number of software solutions (known as Picture Archiving and Communication Systems, or PACS) have been developed.

Conclusion

There is still a lot of work to be done before dentistry is fully linked with DICOM. For example DICOM images, must be compatible with the several electronic dental record software solutions now on the market that are currently available. The DICOM group for dentistry has met to discuss issues related to the DICOM standards, such as the use of imaging in diagnosis, treatment simulation, treatment guidance, and tissue restoration. As well as the development of guidelines for standardisation of digital photographic structured displays for both intraoral and extraoral projections, and the creation of reports templates. The development of guidelines for presentation includes overlays used in dentistry, and surgical workflow issues within DICOM used in dental implantology.

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