

DIGITAL IMAGING SYSTEMS – A REVOLUTION IN THE FIELD OF MODERN DENTISTRY

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One can come across a customary scenario at a Dental Clinic—a patient approaches a clinic, writhing in toothache, with gloomy face after spending a painful night. After pretty long time of wait in reception room, eventually gets access to the doctor, who after examining the patient, establishes a provisional diagnosis of his or her condition and announces—need for an x-ray. Patient agrees. X-ray or x-rays are taken. But, not all the clinics provide the report of x rays instantly as obtaining the x-ray report means a trip down the hall to the developing room, a few minutes of developing, processing and drying. In case of failed x-ray image, again the entire procedure has to be repeated. Needless to mention, the patient is provided the next appointment, only to have more prolonged management, further adding to his or her woes.

This familiar scenario has become a memory of past with the invention of Digital Radiographic technology and the electronic readout devices. The current advances in the field of Dentistry are the testimony that the Digital Imaging System is fast replacing and surpassed by the traditional x-ray system with the new, state of the art Dental Digital radiography Techniques. With the advent of this new technology (Radio VisioGraphy), instead of the time consuming and cumbersome procedures of obtaining, developing and processing of x-ray films; dentist and patient can relax and watch the images of teeth, alveolar bone and gums right in front on a computer monitor within seconds after the device (Electronic Sensor) is inserted into the patient's mouth.

Various computer based imaging systems are

available today to get the Digital Dental Images by both the direct and indirect ways. In the direct method, a digital electronic sensor is used whereas in the indirect method, imaging plates of various sizes are used in the place of x-ray films. Digital Dental Radiography is a computerized radiographic technique in which an electronic sensor is utilized in lieu of conventional x-ray film. Thus obtained images are transformed into its digital form and can be viewed on the computer monitor. In this technique, the electronic sensor is sensitive to x-rays. Hence, when exposed to radiation, it captures the image of an object and sends the electronic message through the fiber optic cable to the hardware of CPU of computer, which in turn works on it and converts the message obtained into the digital image with the help of software. Digital images so received can be viewed on the computer monitor which can be worked on and stored in the computer for the permanent record. The main important facet of this technology is the avoidance of x-rays, which are otherwise mandatory to arrive at a proper and final diagnosis and appropriate management planning in any case.

Apart from conserving time of the doctor, his assistant and the patient by obtaining the quickest scanned images, the other advantages of the technology are too many to mention a few. The prime one among all of them is approximately 90% reduction in x-ray dosage, the doctor and the patient used to receive in the conventional x-ray technique. Here they are exposed to only 1/10th of the x-ray dosage delivered in normal conventional x-ray technique. Hence, due to this advantage, the technique is relatively safe to the females during

pregnancy and children, especially where the high radiation dose is very harmful. Moreover the scanned images are of high resolution giving sharper, faster, clearer and accurate images than x-ray film images. The digital images can immediately be stored in the computer memory for the future and permanent patient record. Thousands of such images can be stored this way and can be instantly recalled at any time later in future. They can not only be easily retrieved but also can be combined and manipulated to supply more information. Hence, all the problems associated with x-ray films like storage and missing of x-rays can be eliminated. There is a definite improvement in diagnostic performance of this technique over the conventional radiography, in detecting hidden and not so easily seen carious lesions, apical pathology and pathologies of gums. Being ecofriendly in nature, the technique saves chemical waste associated with x-ray films and provides a great help in maintaining office hygiene as well.

IntraOral camera is again a digital device and an integral part of the Innovative Digital Dentistry which has got built-in image capture facilities and provides the patient the finest imaging IntraOral photography. This is also an excellent patient motivation and education device. Patient can view his or her dental condition while relaxing in a dental chair and also view the justification of required urgent or suggested treatment plan (by dentist) and very importantly the improvement or progress postoperatively.

Bone Densitometer is also an electronic device to measure bone density and very useful to find out the bone fracture risk in a patient. The device after examination gives the results within few seconds and is of great use in the patients undergoing Implant surgeries.

The Digital Dental Technology helps in every step of clinical Procedure and saves time all through the procedure giving fast, accurate, long lasting treatment results and improves the prognosis of any specific case. With the advent of Digital imaging systems, the transmission of images to any part of

the world has become possible through Internet to consult other specialists for diagnosis, conference or educational purpose. As quite a handful of dental clinics world wide are well equipped with such imaging systems, the Digital technology has come a long way in providing the best of services to mankind and very surely has become the technology of today and tomorrow.

Considering the numerous advantages obtained from the various computerized imaging technology, the present and future dental patient can heave a sigh of relief for the cumbersome long hours can well be avoided at the dental clinics and not only quicker but quality enhanced improved results would be gifted with.

CONCLUSION:

Computers being the essential and very part of the modern day dentistry practice, various digital systems have come a long way serving the mankind with the state of the art Dentistry. The current advances in the field of Dentistry are the testimony that the Digital imaging system is fast replacing the traditional film based technology with new, state of the art dental computerized radiography. Digital Radiography has definite value over film-based radiography in diagnosing various dental diseases accurately and their perfect management within no time, making the technology not only user friendly but, fast, accurate, conservative and ecofriendly. Various computer based imaging systems are available, which give the Dental digital images by both direct and indirect ways.

Digital Intraoral camera not only plays an important role as a patient education device in explaining patient about occurrence, progress and consequences of any dental disease and its management, but also gives greater clinical efficiencies.

The latest invention in the field of the digital imaging system is the bone densitometer, which gives the true picture of the bone density. Due to the numerous advantages and associated features, the Digital Imaging systems are going to play an important role in the modern day dentistry.