INTRODUCTION

It is a growing era now and everyday new innovations and researches are going everywhere. Such innovation in dentistry came through 'TELEDENTISTRY'. It is a relatively new field that combines telecommunication technology and dental care.

Teledentistry is a combination of telecommunications and dentistry. “Tele” is a greek word meaning “distance” and “mederi” is a latin word meaning “to heal.” The term “teledentistry” was used in 1997, when Cook defined it as “the practice of using video-conferencing technologies to diagnose and to provide advice about the treatment over a distance”.

Teledentistry launched in 1994, according to Rocca, citing Vandre, when the U.S. Army conducted its first study using 15 periodontal patients. The patients were first referred to Fort Gordon, Ga., for surgery. One week after surgery, each patient reported to Fort McPherson, Ga., for suture removal – a site located 120 miles away. Using a dental image management system in conjunction with an intraoral camera to capture color images of each patient's mouth, the staff transmitted images from Fort McPherson to Fort Gordon. Only one of the 15 patients needed to return to Fort Gordon. The group's overall consensus was that they received better care than normal and were quite pleased with the elimination of the long trip.

Teledentistry, through the use of telecommunication and computer technologies, provides interactive access to specialist opinion that is not limited by the constraints of space and time. Teledentistry will be the clinical dimension of the new patient-doctor relationship.

A definition of telemedicine helps identify the Emerging realm of teledentistry”. The combined use of telecommunications and computer technologies to improve the efficiency and effectiveness of health care services by liberating caregivers from traditional constraints of space and time and empowering consumers to make informed choices in a competitive marketplace.

TYPES OF TELEDENTISTRY:

A) Real-time consultation

(B) Store and forward.

Real-time consultation involves videoconference in which dental professionals and their patients, at different locations, may see, hear, and communicate with one another.

Store and forward, on the other hand, involves the exchange of clinical information and static images collected and stored in the telecommunication equipment.

In store and forward, the dental practitioner collects all the required clinical information and
digital intraoral and extra oral images and radiographs (or scanned, originally no digital images) and forwards them for consultation and treatment planning via established networks and/or the Internet and treatment is provided in a far timelier, targeted, and cost-effective manner.

Tools that can be used in teledentistry are-

1) POTS- Plain old telephone system, most widely used system as of its low cost. Data exchange is possible with the help of fax machine also.

2) ISDN- Integrated services digital network it provides high speed and information can travel in both directions simultaneously.

3) World wide web- This a popular tool now-a-days as it does not require special network like ISDN.

Live video conferencing can also be conducted through Satellite. To practice teledentistry, there are certain hardware, software and network connection requirements.

A desktop or laptop computer with substantial hard drive memory, a significant amount of RAM, and a speedy processor is essential. A digital camera, video camera, and intraoral camera, and a panoramic digital X-ray unit, preferably portable, is required to provide consulting dentists with images of maximum clinical value. Microphone, headset or external speaker, and a webcam is highly desirable for PC-based videoconferencing.

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A comprehensive software capable of image acquisition and storage, and transmission of the gathered information and software capable of coding and decoding audio and video (codec) is desirable. Digital images for teledentistry transmission should be recorded in DICOM (digital imaging and communications in medicine) format. This is a standard developed by the American College of Radiology and the National Electrical Manufacturers Association to aid the distribution and viewing of medical images.

There is great variation in levels and speeds of connectivity to the Internet; and this is, of course, of major significance to the practice of any forms of telehealth. Dial-up connections, though economical, are not sufficient for teledentistry, due to limitations in quality and questionable reliability. Broadband technology, increasingly widespread and available, offers a selection of cutting-edge alternatives well suited to the needs of the teledentist and his staff. DSL (digitally subscribed line), cable and satellite modems, ISDN (integrated service digital networks) and ultrahighcapacity T1 services, are all available for utilization as the basis of any teledentistry system. To enable live videoconferencing, one might employ a widely available standalone IP/ISDN videoconferencing solution, or install a PCI codec board into the system.

This is a digital signal processing unit that converts analog input into digital on the sending end, while another codec board reverses the mechanism at the receiving end. If a live group session is desired, a multipoint control unit that bridges three or more parties is required. The codec must be able to accommodate audio and visual functions and be compliant within recommended guidelines.

ROLE OF TELEDENTISTRY AMONG DIFFERENT BRANCHES

ROLE OF TELEDENTISTRY IN ORAL MEDICINE-

It can be used for the diagnosis and management of oral mucosal diseases. The ultimate goal of a teledentistry consultation would be, to enable the consulting provider (general dental practitioner, dental specialist, or medical provider) to make a sound patient management decision that may in some instances involve referral to an appropriate specialist.

The e-mail may be best used for exchanging ideas, disseminating the latest scientific information, and discussing the potential diagnoses only. Valuable photographs of that particular patient can be send to
ROLE OF TELEDENTISTRY IN RADIOLOGY-

Teleradiology is the transmission of radiological patient images, such as x-rays, CTs, and MRIs, from one location to another for the purposes of sharing studies with other radiologists and physicians. Teleradiology improves patient care by allowing Radiologists to provide services without actually having to be at the location of the patient. Teleradiology allows for trained specialists to be available 24/7.

Teleradiology utilizes standard network technologies such as the internet, telephone lines, wide area network, local area network (LAN) and the latest high tech being computer clouds. Specialized software is used to transmit the images and enable the Radiologist to effectively analyze what can be hundreds of images for a given study.

Technologies such as advanced graphics processing, voice recognition, and image compression are often used in Teleradiology. Through Teleradiology, images can be sent to another part of the hospital, or to other locations around the world.

ROLE IN ORTHODONTICS

Interceptive orthodontic treatment prepared by general dentist and supervised by orthodontists through teledentistry is a good approach in reducing malocclusion in patients where referral to orthodontist is not feasible.

In the study, using teledentistry services hapes the mouth to reduce or eliminate the malocclusion. Using the Peer Assessment Rating (PAR) index to score the outcomes of the procedure, the authors found that the general dentist fared nearly as well with the aid of teledentistry as the residents did under direct supervision. Teledentistry offers General Dental Practitioner (GDP) a usable means for obtaining quick access to orthodontic advice. Teledentistry helps to reduce the number of inappropriate referrals and enable dentists to treat more patients themselves.¹⁰

It guided the general dental practitioner (GDP) through the assessment of a patient's malocclusion and helped ensure that all relevant clinical observations were made and details recorded. The resulting data file, containing radiographic images and clinical data, was then transferred via the Internet to a dental specialist.

The specialist's recommendations were returned by the same route or where appropriate, a real-time videoconference was conducted. According to Stephens et al the majority of UK orthodontic consultants were in favour of developing teledentistry techniques to provide orthodontic advice to general practitioners. These methods should be used by orthodontists in other countries to obtain second opinions from their specialist colleagues and to provide immediate advice to referring general practitioners. Telemedicine techniques may also have a role in facilitating continuing professional education and clinical audit in orthodontics.¹¹

ROLE IN ENDODONTICS

Remote dentists can identify root canal orifice based on images of endodontically assessed teeth. Videoconferencing as a medium of teledentistry can successfully diagnose various periapical pathologies, this factor reduces the cost of visit along with urgent results.

ROLE IN PROSTHODONTICS

In rural areas through videoconferencing one can easily diagnose and plan a treatment for patients that require oral rehabilitation or prosthetic appliances.

ROLE IN PERIODONTICS

It was by the US Army when teledentistry was first tested at Fort Gordon, Georgia in July 1994. In this study in conjunction with an Intraoral camera a dental image management system was used to capture color images of a patient's mouth. Using a 9600 band modem these images were then transmitted from the dental clinic over to Fort Gordon, Georgia, a distance of 120 miles.

Fifteen periodontal patients were referred to Fort Gordon for surgery. One week after their surgery, each patient reported to Fort McPherson for suture removal and intra-oral imaging. At the time of suture removal color still images were obtained of the surgical sites and these images were transmitted to Fort Gordon for examination by the Periodontist who performed the surgery.¹²

And intra-oral imaging. At the time of suture removal, color still images were obtained of the surgical sites and these images were transmitted to Fort Gordon for examination by the Periodontist who performed the
surgery. The results of this study showed that 14 of the 15 patients saved the return trip to Fort Gordon. The patients uniformly felt that they had received better care than they normally received and were especially pleased at the elimination of the long trip to Fort Gordon. The dentists were also comfortable in their ability to make proper decisions and diagnoses using the equipment.

ROLE IN ORAL PATHOLOGY
The University of Florida, College of Dentistry (UFCD) developed and evaluated a web-based CDE (Continuing Dental Education) format (“Case of the Month”) that specifically focused on clinical oral pathology. The primary purpose of this study was to evaluate the expectations and attitudes of these CDE participants.

A case was presented and a differential diagnosis in the form of a question was developed, followed by a detailed description and rationale describing why the option was correct or incorrect. At the conclusion of the case of the month, respondents completed an online survey that ascertained their needs, expectations, attitudes, level of clinical knowledge gained and experience with the online environment.

Results suggested that the participants' needs and expectations were generally met. The biggest disadvantage reported was the inability to communicate with others, including the instructor while viewing the case and more respondents would like to have seen some more general/common oral pathology information.

ROLE IN PEDIATRIC AND PREVENTIVE DENTISTRY
It is a good tool for screening dental caries in children, one can detect caries easily among school going children and then these children can be divided in to different categories of high risk and low risk patients. It has also been found that intraoral camera is a good means of visual examination and early detection of childhood caries.

CONCLUSION
A system of teledentistry further enables dentists to share patient information, radiographs, graphical representations of periodontal and hard tissues, lab results, tests, remarks, photographs and other information transportable through multiple providers. This data sharing can be of an extreme importance for patients, especially those in need of specialist consultation and co-operation of dentists facilitates and improves clinical decision-making.

REFERENCES