Digital Health

Community Teledentistry
A New Horizon to Upscale Public Dental Healthcare

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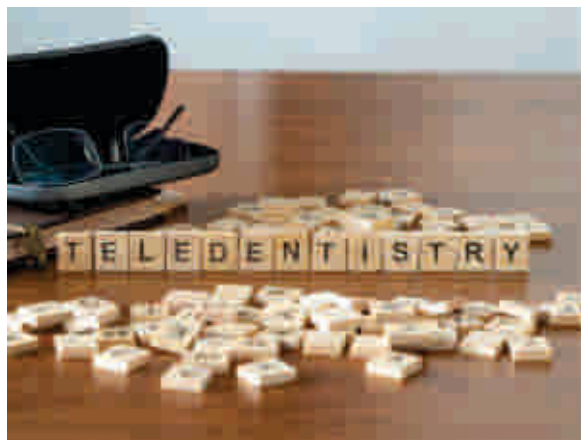
Introduction

Telemedicine based practice for Dentists serves as an invisible bridge between patients and dentists, connecting them from a distance. In a growing number of countries, the use of Telemedicine technology has been one of the initiatives taken by the healthcare systems as a public-private partnership. This twenty-first-century approach has the potential to be efficiently patient centered while protecting patients and physicians with a limiting effect on the spread of infectious diseases.

Dental Health deterioration due to lack of prompt care is the precursor to many systemic illnesses such as Gastrointestinal conditions, Growth Disorders, personal appearance, cosmetic factors, etc. Teledentistry has the potential to bridge the gap of service by extending the reach of a Dentist without them moving to a peripheral location. This article sums up the Technical Fabric of such a Community Teledentistry system.

What is Tele-dentistry?

Tele-dentistry is a service "connecting a dentist to a patient through one or more channels of Telecommu-nication using a suitable software with both of them at different physical locations."

In short, Teledentistry implies a Virtual Dental Consul-tation over the Internet with the care receiver and care-giver not required to be present at the exact physical location.

Tele-dentistry can be of various types, as detailed below:

Structural types of Tele-dentistry

Live or Synchronous Tele-dentistry

In this format, a patient and a dentist would interact in real-time, which typically involves live-2-way video communication, ideally embedded within Tele-dentistry software designed with seamlessly incorporated features of the Dental Disease Management Support System.

Store & Forward or Asynchronous Tele-dentistry

The patient's dental health information whether oral cavity images or a dental history form is stored and forwarded electronically for review by a dentist at a subsequent time, who then interacts by sending dental advice back to the patient. The process steps are mostly carried out offline, not in real-time.

Functional types of Tele-dentistry

Direct Tele-dentistry

Such service would involve a patient having Teleconsultation directly with the Dentist without needing a coordinator or an assistant by visiting a Tele-dentistry website.

Assisted Tele-dentistry

This type is also known as Hub and Spoke Tele-dentistry, which typically involves the assistance of a trained Tele-dentistry Coordinator who would help a patient visiting a Tele-dentistry spoke to register, connect, and be examined by a remotely-based Dentist using suitable Tele-dentistry Software and Tools such as Dental Camera etc.

This type, known as "Hub and Spoke Tele-dentistry", has a great value in Community Dental health as "Oral Hygienists or Dental Nurses" can set up Tele-dentistry Spokes. It then can facilitate Tele-dentistry Consultations with centrally based Dentists, thus extending the radius of outreach of dental healthcare.

The ability to perform a procedure by an Oral Hygienist or a Dental Nurse will be limited. However, several of the common ailments can still be dealt at their level, which reduces the burden of dental diseases and encourages an entrepreneurship trend in society.

Such Tele-dentistry spokes can provide business opportunities both at individual and an organization's level, encouraging investment into the Dental Health field.

Essential Elements of a Tele-dentistry Software

A Tele-dentistry Software should have the following attributes as minimum essential to qualify for inclusion in a Dental Practice.

- Dental Appointment Management Portal
- Dental Practice Management Portal
- Dental History Taking
- Oral Cavity Visual Examination
- Taking, Marking & Storing Dental Images or video clips

- Prescribing a Management Plan (Prescription, Suggesting Procedure)
- Auto-summary of the Patient-Dentist Encounter
- Patient Education on Dental Hygiene
- Referral to other relevant specialists
- Follow up Appointment System

Dental Appointment Management Portal

Patients should be presented with a Dentists Calendar for elective appointments, or Instant Appointments can be made available for online dentists. Patients can directly manage such a process, or an option to call a local phone number to have an appointment made can be part of the Tele-dentistry software, termed as Managed Tele-dentistry Practice.

Dental Practice Management Portal

The interface to create Appointments for Dentists, manage rescheduling and cancellation with notifications, etc., is an essential part of Tele-dentistry practice. The billing and accounts portal also make an integral element of the Tele-dentistry business enabling credit card payments and refund structure built within the Software, with or without the involvement of a local Telecom service.

Dental History Taking

Structured Dental History Taking involves asking questions about the presenting dental complaint and its description, exploring relevant past medical history of conditions and procedures, implants or braces, etc.

A pre-set history form embedded within a Tele-dentistry Software will help collect data in a structured layout and ensure that all the relevant questions are asked. It has a training value as well for the Tele-dentistry coordinator.

Oral Cavity Visual Examination

Most dental conditions present with overt physical markers and are visible at the patient's oral cavity visual examination.
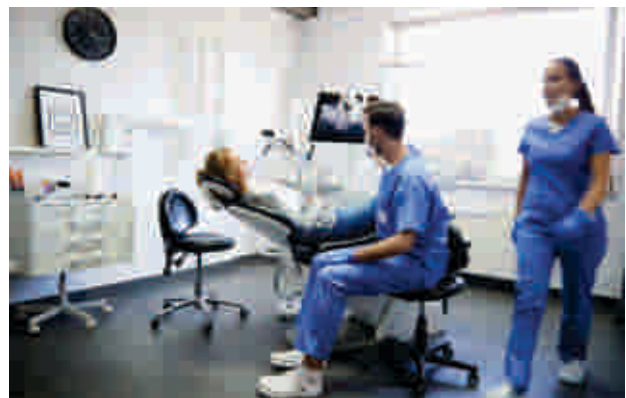
For the Asynchronous or Store and Forward type of

Teledentistry, a patient can upload images for review by the Dentist before the follow-up appointment. For Live Tele-dentistry, however, a mobile phone camera or a specialized Dental Camera can provide clear visual information to the remote Dentist.

The overt clinical findings such as red and inflamed gums, broken teeth, dental cavities, and gum swelling can easily be visualized through modern smartphone cameras or specialized Tele-dentistry cameras if a patients visits a Tele-dentistry Spoke (a peripheral point of Dental Telemedicine Network).

With the training of the Tele-dentistry Coordinator, a tactfully conducted visual dental examination through the Tele-dentistry camera can help the remote Dentist gain sufficient information for reaching a clinical opinion or differential diagnosis.

At a Tele-dentistry spoke, a scheme of visual imaging
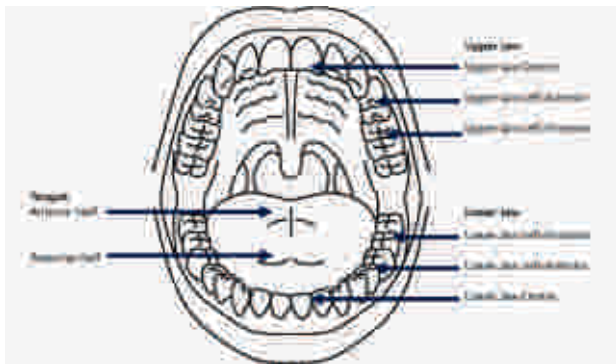
is followed so that no part of the Dental Cavity gets omitted. The Dentist examining the patient remotely gets to see whole of the Dental Cavity with a more detailed view of the area of interest. The oral cavity can be divided into visual field sectors, as shown in the diagram.

Requesting or Planning Investigations

The remote Dentist can either request a Radiograph for viewing at a subsequent appointment, or if a facility is available, such radiographs can be taken at the Tele-dentistry Spoke for immediate visualization through the Software interface.

For highly advanced Tele-dentistry Spokes, the digital X-rays are live-linked to the Dentist for high-definition viewing.

Prescribing a Management Plan (Prescription, Sugges-ting Procedure)

A custom-designed Tele-dentistry Software should provide editable templated prescription or dental management forms for prescribing a Dental Management Plan.

The form should suggest whether a procedure should be carried out by the Tele-dentistry Coordinator or the patient be referred to a local Dentist, depending upon the nature of the dental procedure.

Auto-summary of the Patient-Dentist Encounter

An efficient Tele-dentistry Software is empowered with

a system of auto-capturing the information flow during the Teleconsultation to populate it in a Tele-consultation Summary format as a record of the patient-dentist encounter.

It would also build up Electronic Medical Records of Dental Health for a subsequent review at a follow-up appointment. Such summary is downloadable in pdf format at both patient and dentist end. Such records can become part of a Dental Health Audit or Clinical Trial.

Patient Education on Dental Hygiene

The Tele-dentistry Software's education portal will help raise awareness in the form of a built-in portal to display images or play short video clips.

Patient Referral to relevant Specialists

The Auto-summary of the Teleconsultation can be emailed from within the system to a relevant specialist for any further management.

Follow-up Appointment System

The ability to create a follow-up appointment by looking up at the available appointment slots makes a Tele-dentistry software practice-efficient and helps to generate better revenue.