Proposed American Dental Association
Technical Report No. 1112

Teledentistry

ADA American Dental Association®

2023

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Introduction

The American Dental Association Standards Committee on Dental Informatics (SCDI) develops informatics standards and technical reports to assist the dental profession with hardware and software selection, digital imaging including radiography and photography, interoperability, electronic data storage, data security and more. The SCDI is organized into Subcommittees and Working Groups. The Subcommittee on Clinical Informatics includes the Working Group on Teledentistry in Dentistry (WG 11.11). This working group has used three subgroups to facilitate its work. These were organized as follows:

- WG 11.11 - Teledentistry in Dentistry
    Chair – Dr. Paul Glassman
    - Subgroup on Quality of Data and Imaging Records
        Co- Chairs –Dr. Sanjay Mallya and Dr. Peter Mah
    - Subgroup on Record and Data Sharing
        Chair – Dr. Greg Zeller
    - Subgroup on Teledentistry System Components
        Chair –Dr. Paul Glassman

The purpose of this Technical Report is to provide information for the profession on the informatics aspects of the evolving field of teledentistry and to assist providers in determining goals, selecting components, and creating working systems. While this document is a technical report, some of the material referenced may be in ANSI/ADA Standards and other technical reports. Any use of this information must conform to federal laws and regulations as well as the laws, regulations, standards, and guidelines in the state and jurisdiction where the providers and patients involved are located. Also, laws, regulations, standards, and guidelines change over time, so it is important to be aware of the latest versions.

This Technical Report also contains an Appendix in the form of an Adoption Guide designed to assist providers considering incorporating teledentistry in their practices or practice systems in making decisions about how they will use teledentistry, what arrangements they need to make, what hardware and software choices they could consider, and how they could organize a system that includes teledentistry as one of its components

Background

While the use of communication systems to facilitate dental care is not new, interest in teledentistry has increased in the last several years. For example, teleradiography which is a subset of teledentistry, predates the advent of the internet and is a century old idea. Consider this excerpt from a 1929 paper: "Through the courtesy of the Western Union Telegraph Company, we publish two dental radiographs transmitted by telegraph and photographs of the simple appearing but most ingenious machines which make this modern wonder possible. Even the filled root canals show up well. This service is available commercially if you should want to consult with a distant dentist."[1] Since that publication an extensive literature has developed

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[1] Sending dental X-rays by telegraph. Dent Radiogr Photogr 1929;2(2):16

about various aspects of teledentistry to the point where there are now systematic reviews of systematic reviews.[2] The review just referenced concluded, in part, that teledentistry is an effective means for dental referrals, treatment planning and compliance and treatment viability. There was increased interest in and use of teledentistry starting in 2020 as a result of concerns about spread of infection during the COVID-19 pandemic and the increased availability of social media platforms and other uses of technology that allow easy and effective communication on a personal and professional level. In addition, modern dental materials and techniques and expanding roles for allied dental personnel and improvements in communication systems and hardware and software developments now allow oral health professionals to consider additional means to engage patients in dental care systems beyond in-person visits in a dental office or clinic. Also, there is growing recognition among members of the public that many kinds of services can be delivered remotely, including growing interest in having some types of oral health services delivered remotely as well. Finally, there is growing interest and activities among providers and vendors who are developing hardware, software, and operational systems to facilitate the use of teledentistry.

Definitions

A number of organizations have published definitions and descriptions of "telehealth", "telemedicine", and "teledentistry". These include:
- The American Dental Association's Policy on Teledentistry.[3] This policy indicates that "Teledentistry refers to the use of telehealth systems and methodologies in dentistry. Telehealth refers to a broad variety of technologies and tactics to deliver virtual medical, health, and education services. Telehealth is not a specific service, but a collection of means to enhance care and education delivery."
- The American Dental Association's Guide to Understanding and Documenting Teledentistry Events.[4] This guide indicates that "Teledentistry provides the means for a patient to receive services when the patient is in one physical location and the dentist or other oral health or general health care practitioner overseeing the delivery of those services is in another location. This mode of patient care makes use of telecommunication technologies to convey health information and facilitate the delivery of dental services without the physical constraints of a brick-and-mortar dental office."

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[2] Gurgel-Juarez N; Torres-Pereira C; Haddad AE; et. al. Accuracy and effectiveness of teledentistry: a systematic review of systematic reviews. Evidence-Based Dentistry. 2022 Jul 08.

[3] American Dental Association. Policy on Teledentistry. https://www.ada.org/about/governance/current-policies/ada-policy-on-teledentistry

[4] American Dental Association. D9995 and D9996 – ADA Guide to Understanding and Documenting Teledentistry Events, Version 3, October 1, 2021. https://www.mouthhealthy.org/~/media/ADA/Publications/Files/ADAGuidetoUnderstandingandDocumentingTeledentistryEvents_v3_2021Aug20210804t165513.pdf?la=en

- The Center for Connected Health Policy's bi-annual report on state telehealth laws and reimbursement policies.[5] This report contains definitions, rules and practices in telehealth across the 50 states in the United States.
- The American College of Radiology's Report of the ACR Task Force on Teleradiology.[6] . In 1994, the American College of Radiology (ACR) published its first standard for Teleradiology. By 2013, the ACR had published the third revision on standards for Teleradiology.

The most general term in use now is "telehealth" which refers to the use of communication and computing systems, as above, in all fields of health care. When describing the use of these systems in a specific area of health care, terms like "telemedicine", "teledentistry", "teleradiology", "teledermatology", "telepsychiatry", etc., are used.

Federal and state government entities, professional organizations, and other groups have varying definitions of terms related to the use of telehealth.[5,7] Commonly used definitions include:

- <u>The originating site</u>: Where the patient is located during the interaction.
- <u>The distant site</u>: Where the provider is located during the interaction.
- The modality: The way the service is provided. This includes:
    - <u>Synchronous telehealth or live video</u>: This refers to real time interactions that may include audio only, audio and video, or video only interactions. Some states, or jurisdictions, but not all, recognize "audio-only telehealth" as a real time modality.
    - <u>Asynchronous or store and forward</u>: This refers to systems where records are collected at an originating site and made available to a provider for review at a later time and at another place. Some states or jurisdictions include remote patient monitoring or communication through secure email in this category.
    - <u>Mobile Health or "eHealth" or "mHealth"</u>: This refers to the use of mobile devices in telehealth systems. These can used in a synchronous or asynchronous manner.
    - <u>Remote Patient Monitoring (RPM)</u>: This refers to using devices for monitoring or providing diagnostic or therapeutic services. This type of monitoring can be used in a synchronous or asynchronous manner.

In addition to the definitions listed above there are other terms in use that describe specific actions such as "e-consult" and "e-prescribing". These terms refer to performing a consultation

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[5] Center for Connected Health Policy. State Telehealth Laws and Reimbursement Policies Report, Fall 2022. October 2022. https://www.cchpca.org/resources/state-telehealth-laws-and-reimbursement-policies-report-fall-2022/.
[6] The American College of Radiology. Report of the ACR Task Force on Teleradiology. https://www.acr.org/Practice-Management-Quality-Informatics/Legal-Practices/Teleradiology.
[7] Center for Connected Health Policy. Telehealth 101: What is Telehealth: Terms and Modalities. https://www.cchpca.org/2021/09/WHAT-IS-TELEHEALTH.pdf.

or prescribing medications or providing other health services using one of the electronic telehealth modalities.

Coding

The American Dental Association's Code on Dental Procedures and Nomenclature (the CDT Code) includes two CDT procedure codes specifically for recording the use of teledentistry activities.[8] These are:

- D9995 teledentistry – synchronous; real-time encounter
- D9996 teledentistry – asynchronous; information stored and forwarded to dentist for subsequent review

Some payers have a fee that is payable when these procedures are performed. However, most public and private payers use these codes only for tracking purposes. In general, teledentistry is a set of communication and computing tools and activities that are separate from the oral health procedures that are facilitated using these tools. In general, the procedures that are facilitated using teledentistry tools are coded separately from teledentistry modality (D9995/D9996).

Use of Telehealth Technologies in the General and Oral Health Industries

There is now widespread adoption and use of telehealth technology in general health care. The Center for Connected Health Policy, now designated as the National Telehealth Policy Resource Center, publishes a bi-annual report on state telehealth laws and reimbursement policies in all 50 states.[5] They also provide many other reports and resources on the use of telehealth.[9]

Many other organizations have published reports on the use of telehealth as well and there is now a large and growing literature on the use and effectiveness of teledentistry. Some examples are:

- The American Medical Association's publication on *Return on Health: Moving Beyond Dollars and Cents in Realizing the Value of Virtual Care Report*.[10] This report includes a general overview of the increasing use of telehealth technologies in general health care.
- Report of the ACR Task Force on International Teleradiology.[11] This report points out that not only is teleradiology practiced nationwide but is available throughout the world where there is modern infrastructure. It also indicates that teleradiology has long been at the forefront of telehealth innovation. As a result, teleradiology is the most robust and technically advanced discipline in terms of telehealth. Teleradiology growth has led

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[8] American Dental Association. The Code on Dental Procedures and Nomenclature (the CDT Code). https://www.ada.org/publications/cdt.

[9] Center for Connected Health Policy. Home Page. CCHP is the National Telehealth Policy Resource Center. https://www.cchpca.org/.

[10] American Medical Association. Return on Health: Moving Beyond Dollars and Cents in Realizing the Value of Virtual Care Report. - https://www.ama-assn.org/system/files/2021-05/ama-return-on-health-report-may-2021.pdf

[11] American College of Radiology. Teleradiology: Report of the ACR Task Force on International Teleradiology. https://www.acr.org/Practice-Management-Quality-Informatics/Legal-Practices/Teleradiology.

to the increased reliance, especially in rural areas, to address patient needs and delivering quality radiologic interpretations to hospital emergency rooms and other health facilities that do not have ready access to a radiologist.

- The Rural Health Information Hub's Telehealth in Healthcare web site houses a collection of reports and resources detailing health care management for rural communities through telehealth.[12] These reports indicate that telehealth has been used to improve access to a wide variety of services including radiology, behavioral health services, dermatology, dentistry, audiology, cardiology, oncology, obstetrics, and opioid use disorder treatment. The page also includes resources for providers who are or want to deliver telehealth services to rural communities.

- The Office of the Chief Dental Officer of Canada (OCDOC), along with a team at Université Laval, has released the Canadian Oral Health Screening Tool for Seniors.[13] This tool allows non-dental primary health care providers, primarily nurses, to assess the oral health status of seniors in long term care facilities. The team was then able to develop a plain-language, user-friendly, evidence-based, rapid screening tool for Canadian non-dental primary health care providers to assess oral tissue abnormalities and the dysfunction of dental prostheses in seniors in Canada. This project commenced with the understanding that there are settings, particularly institutional settings, where non-dental health care providers caring for seniors may be hesitant to screen for the oral health issues of their clients in the absence of in-house oral health care providers.

- One of the first organizations to explore teledentistry was the US Army. Two US Army pilot projects were initiated in 1994, and they demonstrated that teledentistry could save patient travel and evacuations.[14]

- Teledentistry has been demonstrated to be a practical and cost-effective way to improve access and increase oral health care use, especially among rural and disadvantaged children. Reducing the costs of and barriers to accessing oral health care, improves oral health outcomes, increase the use of oral health care resources, and leads to the establishment of a dental care for underserved children.[15]

- Covid-19 pandemic lockdowns led to new teledentistry implementations, most commonly for triage but also for follow-up and nonprocedural care. Previous teledentistry publications have reported the reduced need for in-person visits and improved access to remote areas.[16]

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[12] Rural Health Information Hub. Telehealth Use in Rural Healthcare. https://www.ruralhealthinfo.org/topics/telehealth.

[13] https://www.fmd.ulaval.ca/recherche/the-canadian-oral-health-screening-tool-for-seniors/

[14] Vandre RH, Kudryk VL, Fay CR, Edwards JC, Jones TK. US Army teledentistry. In: Proceedings of the national forum: military telemedicine on-line today; research, practice, and opportunities. New York (NY): IEEE; 1995. p. 53–56.

[15] Kopycka-Kedzierawski DT, Billings RJ. Comparative effectiveness study to assess two examination modalities used to detect dental caries in preschool urban children. Telemed J E Health. 2013;19(11):834–40.

[16] Hung M, Lipsky MS, Phuatrakoon TN, Nguyen M, Licari FW, Unni EJ. Teledentistry Implementation During the COVID-19 Pandemic: Scoping Review. Interact J Med Res 2022;11(2):

- A large six-year study demonstrated that many traditionally underserved groups, especially children, could be kept healthy in community locations using a "full-service" Virtual Dental Home system.[17]

Delivery Locations and Environments

Teledentistry can be used to support dental services in a variety of ways. This section describes some locations and environments in which teledentistry can be used to support oral health care.

Dental Office and Clinics

The COVID-19 Pandemic accelerated interest in the use of teledentistry to make dental office and clinic care safer and more efficient by supporting pre- and post-visit interactions with patients. These interactions can allow a provider to interact with some of their patients who may not make a trip to the office or clinic, reduce the number of visits that patients make to dental offices or clinics, and shorten the time that patients spend in the office when they do have a dental visit. Some examples include:

- Response to patient-initiated inquiries or patient supplied information in circumstances where a provider can interact with a patient using teledentistry, review patient supplied images or information and make recommendations about next steps.
- Pre-visit data collection of information such as demographics, insurance coverage, and health history information.
- Explanations for patients about upcoming appointments, information about what to expect at the visit, and the ability to answer pre-visit questions.
- Case presentations which, in some cases, can be accomplished better using a live video interaction than is possible in an in-person meeting. They can allow additional family members or support persons to be present. These types of interactions do not require wearing masks which can cover facial expressions. In addition, many patients appreciate not having to travel to the office for a "talking" appointment.
- Post-appointment limited evaluations and discussions with patients to follow up after surgical and restorative procedures.
- Providing patients access to their chart records. Some offices use chart systems that facilitate making all or parts of the patient's electronic record available to a patient.

The complexity of the services provided in a dental office or clinic environment using teledentistry can vary widely. The operational protocols, workflows, software, and hardware requirements for these services will also vary widely and should be dictated by the type of services being provided. See the sections that follow specifically devoted to these topics.

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[17] Glassman P, Harrington M, Namakian, M, Subar P. The Virtual Dental Home: Bringing Oral Health to Vulnerable and Underserved Populations. CDA Journal: 2012: 40(7). 569-577

Community Locations

Many aspects of dental care can be accomplished in locations outside of dental offices and clinics. Using mobile and portable delivery systems or fixed equipment in community locations, teams composed of dentists and allied oral health professionals, or allied oral health professionals alone, can provide a variety of dental procedures in community sites including but not limited to pre-schools and schools, businesses, community centers, physician's offices, adult day programs and residential facilities, long term care facilities, and other types of health care facilities, correctional facilities, educational facilities, and social service facilities. There any many such locations where people live or visit where they receive health, educational, or social services but do not receive oral health services.

Using teledentistry technologies in these locations and facilities can facilitate involvement and communication between oral health personnel at the community location, dentists who not at the community site, oral health specialists, physicians and others.

Bringing oral health personnel and oral health services into community locations can also help support people in adoption of "mouth-healthy habits." "Mouth-healthy habits" refers to toothbrushing, flossing, plaque removal, and other "oral hygiene" activities. It also refers to eating habits, particularly the amount and frequency of ingesting acidic food and drinks and fermentable carbohydrates. These habits are among the most important factors that determine whether an individual has dental disease or not. They are typically far more important in producing long-term oral health than anything an oral health professional can do to or for the patient. However, we know it is extremely difficult for anyone to change long-standing habits. Having messages, monitoring, and support available in community sites, particularly for people who do not visit dental offices on a regular basis, can be an effective tool in reducing the burden of dental disease.[18]

Delivering dental care in community sites can take a variety of forms from simple applications to those with increasing complexity. As with services delivered in dental offices and clinics, the operational protocols, workflows, software, and hardware requirements for these services will also vary widely and should be dictated by the type of services being provided. See the sections that follow specifically devoted to these topics.

Use Cases and Structure

Another way to look at the evolution in the use of teledentistry in oral health care is by reviewing various "use cases." The following is a list of examples of "use cases" with considerations for operational protocols, workflows, software, and hardware that might be useful in these various situations. It is not intended to describe all the ways that teledentistry can be used.

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[18] Pitts, NB, Twetman S, Fisher J, Marsh PD. Understanding dental caries as a non-communicable disease. British Dental Journal: 2021:V231(12), 749-753.

Advice and Referral

Early in the COVID 19 pandemic, many dental offices were closed and chose to stay in contact with their patients by allowing patients to send patient-collected records, photographs or other information to the dental office for review. This type of teledentistry interaction with patients has remained as the most common use of teledentistry. These interactions often end with reassurance to the patient or a recommendation to make an appointment and be seen in a dental office.

If a dentist is occasionally responding to information gathered and sent by a patient, the needs for special hardware, software, organizational systems can be minimal. A response to patient supplied information can be made by scheduling a phone call or video call. Other types of responses are also possible. Whatever type of response system is used, the provider should ensure that their response system is compliant with HIPAA regulations. For example, a response using many commonly available email systems is not compliant with HIPAA regulations. There are, however, secure email systems and other forms of transmitting information, such as secure portals and encrypted email systems, that are compliant with HIPAA regulations should be utilized. See section on HIPAA and the 21st Century Cures Act below.

It is also useful to develop appropriate workflows when responding to patient supplied information. It can be helpful to develop specific roles and procedures for office support staff to help facilitate record intake, virtual appointment or scheduled dentist record review time, and care coordination if needed. These types of supports can aid providers in efficiently balancing teledentistry and in-office interactions

A dentist responding to patient supplied information should understand that there is no requirement for patients transmitting patient-collected records, photographs, or other information to use systems that are HIPAA compliant, but there is a requirement that the health care provider, in this case the dental provider, maintain HIPAA compliance in their communications with the patient. Dental providers should also be aware that not all video communication services are compliant with HIPAA regulations. The provider should select and use a video communication service that is compliant with HIPAA regulations. See section on HIPAA and the 21st Century Cures Act below.

Record Sharing and Consultation

While record sharing between providers is not new, the use of electronic dental records has made it easier for providers to share information and records. Record sharing between providers can take place between oral health providers in different offices, or between a provider in a community setting and one in a dental office.

Sharing of electronic records can also be used to facilitate second opinions requested by patients. In addition, public and private payers often request copies of patient records in processing claims.

In some cases, an existing office electronic dental record (EDR) system could be used for these purposes. However, some newer teledentistry EDR systems have capacities not typically found in office EDR systems. These include the ability to capture and store records of video communications, text messages, and other information not traditionally stored in EDR systems. Also, some newer teledentistry capable systems have the capacity to make information directly available to patients and to multiple providers who may be involved with the patient's care.

See the section on Electronic Data Exchange/Interchange (EDI) Standards below for additional information on record sharing systems.

Teleradiology

One specific type of record sharing between providers involves teleradiology. Among the more sophisticated use cases is the ability of dental offices and imaging centers to send radiographs to an oral maxillofacial radiologist (OMR) for interpretation and preparation of a radiology report in relation to a cone beam computed tomography (CBCT) scan. Since the introduction of CBCT imaging to dentistry in 2005, the OMR was often associated with a university. However, in the last decade more OMRs engage in private practice from the privacy of their own homes. This has resulted in the need for interoperability with the use of a common file format like Digital Imaging and Communications in Medicine (DICOM) format such that any DICOM compliant 3D viewer will allow the user to open and view the CBCT volume. Vendors of CBCT imaging equipment have had to adapt to allow the clinical users the option of exporting the CBCT data in an open architecture format such as DICOM in addition to their proprietary format. See the section on Electronic Data Exchange/Interchange (EDI) Standards below for additional information on the DICOM format.

Increase Office Safety and Efficiency

As described above, adopting an electronic health record system within a dental office can allow some procedures that are typically carried out in the office to be carried out pre-or post-office visits using a teledentistry system. The benefits of using a teledentistry system to increase office efficiency by interacting with patients before and after visits was described earlier. In some cases, this benefit can be achieved with a traditional EDR. However, for optimal impact it can be better to use a newer teledentistry capable system that includes a patient portal, secure systems for on-line completion of forms, communication via text and video, and image sharing capacities, plus the ability to store, track, and share all of this information with the patient and with multiple professionals who may be involved with the patient's care. See the section on Software below.

The Call Center

Some technology companies and dental benefit providers have developed platforms to allow patients to have 24 x 7 access to a dentist. Often these work by having the patient access a website, make a payment on the website, and be connected to a dentist for a real-time video conversation. As with the advice and referral systems referred to above, the result is often

either reassurance for the patient or a recommendation to make an appointment in a dental office. Such a system may require setting up the technology needed to have a commercial level website, collect money, track records of interactions, and track referrals. It may include creating a referral network to facilitate referrals or even the ability to make a referral or create an actual appointment during the session. See the section on Teledentistry Care Networks below

Integration with Other Health Systems

There has been continual progress made towards interoperable electronic health record systems across the health industry. Some EHR systems that are specifically designed for teledentistry are set up to facilitate sharing of records across providers and settings. For optimum efficiency this requires a system that has the capacity to easily share certain specified records or portions of records with multiple, ideally with an unlimited number of other providers.

One of many potential examples of this type of integration is a system where a dental hygienist has scheduled time in a physician's office or medical clinic. This can be an obstetrician's office where the population served is pregnant women, or a pediatrician's office where the focus is on parents and children or a general medical clinic in a health center. The dental hygienist can provide screening, counseling, and preventive procedures. However, the addition of a teledentistry connection to a dentist can allow the additional collection of records, completion of the examination by the dentist, and the performance of additional procedures that may require instructions by the dentist before the procedure can be performed by the dental hygienist.

The level and complexity of operational protocols, workflows, software, and hardware that might be useful in these various situations varies with the situation, the level of care being provided, and the amount of interaction needed between allied personnel located in the health care system site and dentists who are not on site. See the more detailed description of these considerations below in the sections on Community-based Care – Limited Care and Community-based Full-Service Care - Community-Engaged Systems.

Community-based Care – Limited Care

As dental providers have become more comfortable with the use of teledentistry-capable systems for creating more efficient office-based practices, some have realized that they can use the same systems to connect with patients in community settings. The term "limited care" describes systems where members of the dental team may go to a community site and deliver some oral health services. These can include screening, counseling, and preventive procedures such as fluoride and sealant application that can be performed by a dental hygienist in a community setting. There may be some records collected in the community site and transmitted to the dentist. However, the goal and result of these "limited care" systems is to provide some services in the community, but ultimately direct patients to the dental office and try to encourage them to have ongoing care in that office.

Even "limited care" systems require arrangements and agreements with the community locations or organizations where care will be delivered. They require the use of mobile or portable dental equipment if any procedures are performed in the community site. While some records may be collected on a laptop computer or another portable device which is brought back to the dental office and uploaded into the office EDR, it is generally more efficient to use a system with access to the internet in the community site that can transmit the records to the dental office in real-time or near real-time. Even "limited care" systems work best when they use a teledentistry-capable software system. See the sections below on Operational Protocols, Workflows, Software, and Hardware that might be useful in these various situations.

Community-based Full-Service Care - "Community-Engaged Oral Health Systems"

In contrast to "limited care" systems, "full-service care" systems, or "Community-Engaged Oral Health Systems," have the goal of trying to keep as many people healthy in the community location as possible and to require the fewest number of people to make a trip to the dental office as possible. This is possible if the regulatory environment in the jurisdiction allows, and operational and technology systems are capable of having a dentist complete an examination using the teledentistry system and decide which patients are healthy at the time of the examination and do not need to make a trip to a dental office at that time.

The ADA Policy on Teledentistry indicates that "The ADA believes that examinations performed using teledentisty can be an effective way to extend the reach of dental professionals, increasing access to care by reducing the effect of distance barriers to care." However, the policy also states that "In order to achieve this goal, services delivered via teledentistry must be consistent with how they would be delivered in-person. Examinations and subsequent interventions performed using teledentistry must be based on the same level of information that would be available in an in-person environment, and it is the legal responsibility of the dentist to ensure that all records collected are sufficient for the dentist to make a diagnosis and treatment plan."

There are examples of systems that have demonstrated that the majority of people served could be kept healthy in the community location without the need for trip to the dental office. A system that has been tested for several decades called the "Virtual Dental Home system" is now estimated to be able to keep up to 85% of children healthy in community sites without requiring a trip to a dental office.[19] In this type of system collection of patient information and records, and performance of prevention and minimally invasive therapeutic services can be performed in the community location. The dental office becomes the advanced surgical site where more complicated procedures are performed that cannot be performed in the community site. This type of system leads to a revised idea of what a "dental practice" can be. In this "practice without walls" the overall practice is larger, serves more people, and uses difference sites of care for different types of care.

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[19] California Northstate University. The Virtual Dental Home. https://dentalmedicine.cnsu.edu/research-community/virtual-dental/.

Full-service care systems require the most sophisticated operational protocols, workflows, software, and hardware. They work best with a teledentistry enabled software system, ideally connected to a cloud-based record storage system. They also need agreements with community sites, integration of oral health activities into the activities at the community site, mobile or portable equipment, integration of the oral health delivery model into the activities of the community site, and participation of the remote dentist capable of performing examinations and accepting patients in the office who need the kind of procedures that require office treatment.

Some things to consider in developing a full-service, Community-Engaged care system are described here.

<u>Agreements with Community Sites</u>

If a dental provider is going to be bringing dental care to a community site, it is advisable, or in many cases necessary, to develop an agreement with the community site that describes:
- the type of services that will be provided,
- how individuals will be informed and enrolled in the service system,
- how consent for services will be obtained,
- the roles and responsibilities of personnel from the oral health delivery team and the community site personnel,
- operational protocols that list times and locations of services, flow of information, and communication with parents, guardians, and other individuals, and
- liability coverage agreements, indemnification agreements, and agreements related to confidentiality of records.

<u>Legal and Regulatory Environment and Compliance Requirements</u>

There are a wide variety of legal and regulatory environments in various states and jurisdictions that determine the ability to operate a full-service Community Engaged Oral Health System as described here. There also a variety of legal and regulatory requirements that may apply in various community locations were care might be delivered. See the section on Legal and Regulatory Considerations below.

<u>Roles and Responsibilities</u>

As listed above, it is useful to have specific agreements about the roles and responsibilities of various personnel involved in the full-service Community Engaged Oral Health System. Areas that can be addressed in these agreements can include who is responsible for:
- providing information to potential patients in the system about how the system works and how to enroll,
- enrolling patients in the system of care including collecting demographic, health history, and other needed information,
- obtaining consent for care,
- scheduling appointments,

- communicating with parents or caregivers as needed,
- making referrals,
- responding to requests for care for dental emergency situations, and
- overall patient care and ensuring that all the components of a "dental home" are in place, which includes coordinating care, making and monitoring referrals, and making and monitoring follow-up plans and activities.

Enrollment

Another consideration in delivering oral health care in community locations is the process for "signing up" to be in the system. This process can vary depending on the environment, but there are several general areas to consider:

- How people will be identified who are eligible to participate and how they will be informed about the availability of the system? In some cases, this may be best handled by the administrators or staff from the community site. In other cases, the dental care providers may take on this responsibility. It is also useful to decide how people will be notified about the system. In some community sites, direct presentations by the community site staff or by oral health providers may be especially effective.
- What information will be needed from the individual to enroll them in the care system? While all oral health care providers collect demographic, health, and other information from patients, the information collected from people being served in community locations may differ from that collected when someone is receiving care in an office or clinic environment. It is important to decide on the content of this "enrollment package."
- How information needed from people to be enrolled in the care system will be collected? There are various ways that this can be done. In sone cases, paper forms are sent or given to potential participants, and they are asked to fill them out and return them. Typically, higher return rates are obtained in community locations if personnel from the site or the oral health care provider meets with the potential participant or their guardian and helps them fill out the needed forms. Where possible, greater efficiency can be realized if the forms can be filled out electronically in a system that is available at the site or in a patient portal that people or guardians can access on their own.
- In all these steps in the enrollment process it is important to consider and conform to laws and regulations related to patient safety and privacy. See the sections on HIPAA and the 21st Century Cures Act and the considerations about physical security of devices in the section on Computers.

EDR Considerations

As indicated earlier, when using a teledentistry system to provide oral health care, there may be a need for a more sophisticated software environment than is available in many office based EDR systems. See the section on Software below.

IT and Connectivity Considerations

When providing oral health services in community locations, it is important to consider how information obtained in that location will be transmitted and shared with personnel in other locations. One important consideration is whether there is connectivity to the Internet available in the community site. See the section on Connectivity below.

Protocols and Workflow

Full-service Community Engaged Systems that provide oral healthcare in community locations can be complex. It is important that detailed protocols and workflow be developed so everyone involved is clear about the procedures to be followed at each step in the care process.

One critical component to include in system protocols and workflow is a clear description of who is responsible for overall care of the patient. Multiple office, community-based, or allied oral health personnel, or dentists may be involved. However, for the system to deliver the full array of services, monitoring, and follow-up needed in a "dental home", it is helpful to be clear about who has the overall responsibility and authority to ensure that the system provides those services.

Evaluation

Finally, it is increasingly important in full-service Community Engaged systems of care to collect information needed to evaluate and demonstrate effectiveness of the system. Evaluation measures can include process measures that collect information about who was served, what procedures were performed, and whether care was completed, referrals made, and referrals completed. It is also helpful to collect information about improvement in health outcomes from such a system. This can include measures such as reduction in disease rates, lower instances of signs of pain and infection, less use of hospital emergency departments, less use of operating room general anesthesia, and other system outcomes and costs.

Teledentistry Care Networks

As teledentistry systems have evolved, there are now systems being built where providers, community sites, referral networks, and other entities, can be linked together in a way that facilitate referrals and interoperability between systems and providers. Such a system requires a sophisticated teledentistry-capable software platform capable of capturing storing and sharing multiple kinds of records with a variety of oral health, general health, and other providers.

Remote Patient Monitoring

Remote patient monitoring in oral health care is not actually a separate use case. It refers to the increasing number of devices capable of collecting information from a patient and making that information available to an oral health provider. Examples of such devices include toothbrushes capable of monitoring time and position of use, pH monitors that can be bonded to teeth or embedded in devices like a toothbrush, or systems that monitor ATP levels or

bacterial levels. The number and capacity of these monitoring devices is growing rapidly and is expected to continue to do so.

Electronic Data Exchange/Interchange (EDI) Standards

The ADA Teledentistry Policy includes the statement that "Dentists are encouraged to consider conformance with applicable data exchange standards to facilitate delivery of services via teledentistry modalities. These include, but are not limited to, Digital Imaging and Communications in Medicine (DICOM) standards when selecting and using imaging systems, X12/HL7 for the exchange of information and ICD-9/10-CM/SNOMED/SNODENT for documentation consistency.[3,20,21,22,23,24,25,26]

Since 2000, the ADA has recommended exchanging digital dental images using DICOM files. A dental imaging system can internally store images using any image file format; however, when these images are exported, it is recommended that they be in DICOM format. DICOM format will assure the persistence of the image from sender to receiver as well as the identification of the patient from one system to another.

Dental providers are also cautioned against the use of JPEG storage of visible light images from a camera or intraoral scanners even though .jpeg is the default file format found on most cell phones and cameras. The JPEG file format uses compression which results in degradation in image quality. The newer jpeg 2000 format is not subject to lossy compression effects. If the provider is unclear about the compression setting in their camera or device, and image fidelity is important in a given situation, they would be better off to use either .tiff or the .bmp file formats instead.

ANSI X12 is an American EDI standard developed in 1979 and stands for American National Standards Institute X12.[22] Implementation of standardized X12 transactions, which are specified under HIPAA regulations for electronic transactions, will greatly enhance the administration of third-party benefits eligibility requests and responses from payers. X12 will also enable electronic claims and payments.

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[20] DICOM Standard. https://www.dicomstandard.org/.

[21] HL7. Health Level 7 International. http://www.hl7.org/index.cfm.

[22] X12. Consensus-based, interoperable, syntax-neutral data exchange standards. https://x12.org/.

[23] Centers for Disease Control. International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM). https://www.cdc.gov/nchs/icd/icd-10-cm.htm.

[24] SNOMED International. Systematized Nomenclature of Medicine. https://www.snomed.org/

[25] National Library of Medicine. SNOMED CT. https://www.nlm.nih.gov/healthit/snomedct/index.html.

[26] American Dental Association. The Systematized Nomenclature of Dentistry (SNODENT) is a vocabulary designed for use with electronic health and dental records. https://www.ada.org/topic/SNODENT#sort=%40topicsortdate%20descending&f:@contenttag=[SNODENT].

Health Level Seven (HL7) is a set of international standards used to provide guidance with transferring and sharing data between various healthcare providers.[21,27] HL7 exchanges of dental data offer interoperability among different electronic dental record systems as well as with medical electronic record systems. Providers from various dental and medical systems can easily exchange referrals and consultations when HL7 dental summary exchange standards are implemented.

X12 and HL7 exchanges of information rely on coding and terminology systems specified by the National Coordinator for Health Information Technology (ONC) as specified in the current United States Core Data for Interoperability (USCDI) version, which in now version 3.[28] ONC also coordinates the Interoperability Standards Advisory (ISA) process, which represents the model that ONC uses to coordinate the identification, assessment, and public awareness of the overall interoperability standards and implementation specifications that can be used by the United States healthcare industry to address specific interoperability needs including, but not limited to, interoperability for clinical, public health, and research purposes.[29] These ONC activities include procedure coding specifications and also include the "ICD-9/10-CM/SNOMED/SNODENT for documentation consistency" mentioned in the ADA Teledentistry Policy.

Hardware

There are a variety of devices that can be used in delivering care using teledentistry enabled systems. As described above, the selection of hardware devices needed varies significantly between different use cases. Some considerations for the use of various types of devices are listed here.

Cameras, Videographic, and Photographic Images

There are a variety of cameras that can be used to capture photographic still or video images for transmission and review by a provider in another location. These include cameras embedded in mobile phones, point-and-shoot or digital SLR cameras for extraoral photography or videography, intraoral cameras, and computer embedded or attached video cameras.

The requirements for resolution of the images and color fidelity will vary depending on the intended use of the image. In some situations, for example when viewing an intraoral soft tissue lesion, the resolution and color fidelity of the image can be critical. In other situations, for example when a dentist is viewing an image of a broken tooth and deciding that the patient needs to make a trip to the dental office for treatment, the resolution and color fidelity of the image may not be as critical.

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[27] HL7 International. HL7 CDA R2 Implementation Guide: Dental Data Exchange, Release 1, STU 1 - US Realm. https://www.hl7.org/implement/standards/product_brief.cfm?product_id=579.

[28] HealthIT.Gov. United States Core Data for Interoperability (USCDI). https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi#uscdi-v3.

[29] HealthIT.Gov. Interoperability Standards Advisory (ISA). https://www.healthit.gov/isa/.

Some factors that can influence the usability of the image are the characteristics of the camera, the lighting available in the site where the image is acquired, the way the image is transmitted, and the characteristics of the monitor on which the image is displayed.

Other considerations for selection and use of the components of a photographic or videographic system includes training needs, infection control procedures to be followed, and compatibility. Compatibility is particularly a concern with intraoral cameras which can require drivers or other software components that may or may not be compatible with the computer or EDR that the dental team is using.

Some disciplines of dentistry have specific requirements for photographic images such as orthodontics and forensic dentistry. The clinician is advised to verify if similar requirements exist for their intended use of photographic images.

It is also helpful to consider the chain of events in using videographic and photographic images in teledentistry system. The components of this chain can include:
- the training, experience, and skill of the individual capturing the image,
- the environment and lighting in the environment and on the specific tissues being imaged,
- image capture in the camera,
- the file format and resolution of the captured image,
- the system for transmission of the image from the point of capture to the time of viewing by the end user,
- the display system, including the monitor on which the image is displayed.

It is critical that a dentist reviewing images of intra or extra-oral tissues on a computer monitor or other display device understand that all of the factors listed above can impact the viewed image and therefore the image they are viewing may deviate in color, contrast and detail from the actual appearance of the patient's tissues.

As above, there are situations where having a fully accurate representation of the patient's tissue will not impact subsequent decisions. There are other situations where the color, contrast, or visibility of detail in a viewed image can make a difference. Therefore, the degree to which images accurately represent the patient's tissues can in importance in making decisions in clinical practice. It is the responsibility of the dentist reviewing images and other records to decide if they have the information they need to evaluate the patient's condition based on the image and other supplied information and determine next steps, or to decide that they need additional information in order to do so.

Computers

Most modern computer systems are capable of acquiring, storing, and transmitting information needed when using a teledentistry system. However, there may be some software programs, hardware systems, and connectivity requirements that require specific capabilities for the

associated computer systems. Providers should assess the requirements of all of the hardware components of the teledentistry system they intend to use to ensure compatibility of various components.

When using Teledentistry systems in a community site, it is common for the computer system to be a laptop or a tablet system. As above, is important to verify that the software programs, hardware systems, and connectivity requirements for the overall teledentistry system are compatible with the computer device that will be using that system.

One additional consideration when using a laptop or tablet in a community site is security of the physical system and the data it contains. It is suggested that the device be encrypted and have a secure log-in system with two factor authentication such as biometrics, sending access codes to another device, or requiring the presence of an access card to token. It is also suggested that any connection to the internet or another device be a secure connection. There are multiple ways that connections can be secured including using encrypted transmission, using a VPN intermediary, and using multi-factor authentication.

In addition, it is critical that a plan for physical security of the laptop or tablet system be in place and adhered to. In addition to other possible measures, this means not leaving the device alone at any time in a community setting and setting the device to go into a sleep mode if not used for several minutes. It is also safer to use data acquisition and storage systems that do not store patients protected health information on these devices and instead upload and store this information on secure servers and delete this information from local devises as quickly and possible.

Monitors

The computer monitor or display device is the last component in the chain of devices and events described above. There are a number of factors to consider in order to determine if a specific display device will produce acceptable results.

When viewing digital radiographic images one factor is the number of visible shades of gray. Radiologic images may contain up to 256 shades of gray to ensure that there is no clipping of information as a result of the display monitor. Also, if the display is too dim, then contrast between adjacent shades of gray is decreased, lowering the number of perceptible shades of gray. Again, the ability to distinguish details may be impaired.

The resolution of the display is also important. A minimal display matrix of 1280 x 1024 or 1920 x 1080 is recommended. Also, flat displays are recommended as display devices with curved surfaces may introduce distortions in size and relative position to other anatomical structures.

It is recommended that display monitors provide for adjustment of brightness and contrast. A static contrast ratio (difference between brightest and darkest luminance) of at least 800:1 is recommended, although a ratio of 1000:1 is preferred.

As with other components of the chain of devices and events described above, it is the responsibility of the dentist to decide if they have the information they need to evaluate the patient's condition based on the image and other supplied information and determine next steps, or to decide that they need additional information in order to do so.

Other Hardware Devices

There are number of other hardware devices that might be used in a teledentistry system. These include digital sensors for radiographic imaging, photostimulable phosphor plate imaging systems, portable scanners for scanning paper documents, intraoral scanners for recording intraoral structures, and caries detection devices. These devices may have specific requirements for connectivity to a computer system, special software and drivers need to be installed, and specific requirements for transmission of information. As noted above, providers should assess the requirements of all of the hardware components of the teledentistry system they intend to use to ensure compatibility.

A key component of the digital radiographic intraoral imaging chain is the intraoral sensor and the software used to acquire the radiographic images. In order to provide consistent high-quality radiographs, users should refer to ANSI/ADA Standard 1094 Quality Assurance for Digital Intra-Oral Radiographic Systems.[30] As described in the Electronic Data Exchange/Interchange (EDI) Standards section of this document, providers are encouraged to use systems that can produce files in an interoperable DICOM format. It is recommended that radiographic images not be exported in a proprietary format as they may not be viewed by the receiver unless they have the same manufacturer's software. Using a proprietary format could result in a situation where the images need to be reacquired, exposing the patient to needless extra radiation unless a simplified viewer is enclosed with the radiographic images. Problems with viewers exported with radiographic images are that the viewer requires as executable function and installation of software which many anti-viral and computer security programs do not allow to be installed.

Connectivity

As described earlier, in addition to the internet connectivity needs in an office-based environment, when oral health services are performed in a community site there may be a need for additional internet connectivity considerations. This is the case when oral health providers interact with patients in locations that are not traditional locations for dental services. There are multiple ways that this can be achieved including:
- Hard-wired ethernet connections.
    - Some community sites may have hardwired ethernet connectivity that the dental team is able and allowed to use. In these situations, it may be necessary to verify security of data transmission through the use of hardware devices, encryption, VPN software, or other methods.

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[30] American National Standard Institute/American Dental Association Standard No.1094 Quality assurance for digital intraoral radiographic systems (ANSI/ADA Standard No. 1094). December 2020.

- WiFi

    As above, some community sites may have WiFi connectivity that dental personnel are able to use. As with hard-wired connections, it may be necessary to verify security of data transmission through the use of hardware devices, encryption, VPN software, or other methods.

- Cell signal

    Some providers and oral health services in community sites use a cellular signal to obtain Internet connectivity. Cellular signals can be converted to Wi-Fi connections through hotspots built into mobile phones, or with the use of separate conversion devices. Some manufacturers sell powered cellular antennae that can convert a week cellular signal into a usable Wi-Fi signal.

There are currently a number of federal and state initiatives supporting the development and spread of broadband access to locations and groups of people who may not be able to connect to the internet easily now. It is expected that the availability of internet connectivity will continue to grow.

Data Storage

When using Teledentistry systems in community sites there are number of options for storage of electronic records and other data.

- Many dental record systems have moved from local storage to cloud-based storage systems. Newer EDR systems best suited for teledentistry use cloud-based storage. One advantage of cloud-based storage is that these systems records can be used, viewed, and shared by multiple people who are in different locations and who are involved in the care of the patient. Also, many of these systems are set up so that data is stored in the cloud-based storage repository and viewed but not stored on the local computer system. This reduces the risk of a data breach or HIPAA violation.
- There are several other issues to consider when using a cloud-based storage system. One is the need for a plan or back-up system for using the system in a situation where internet connectivity may not be available. Some systems can store data locally on a laptop or other device until it is transmitted to the cloud storage repository. In other cases, some data my need to be recorded on paper and entered when connectivity is next available. The critical point is to have a plan and system available for these occurrences.
- Another issue is the need for data redundancy. Some cloud data repository systems have built in redundancy and systems for data recovery. Other systems allow the provider to download their data and create their own redundant data storage plan. In any case, a plan for data redundancy is essential.
- Some providers use systems where data is stored on an office or central server. In these cases, it could be possible for personnel in various locations to securely access that server using a virtual private network (VPN) system.
- Some providers operate multi-location teledentistry systems using only local storage. That means that data may be collected on a laptop computer or other device in a

community site and the computer physically transported to the dental office where data can be uploaded into the office-based server. The disadvantage of this configuration is it does not allow real-time or near time access of data by personnel in different places. It also stores patient data on the laptop or other device which creates a risk for violation of HIPAA regulations.

Software

As described in this document, there are many different locations, use cases, and configurations for incorporating teledentistry in the delivery of oral health services. As also described earlier, simple teledentistry applications, such as occasional advice and referral consultations, may have only minimal software and hardware requirements. As the sophistication of the teledentistry system grows, so does the need for more sophisticated and complex software support.

Some providers have developed complicated teledentistry delivery systems using various software systems that are not integrated with each other. While this approach can be made to work, it is not the optimal environment for a sophisticated delivery system. Providers who are considering developing more than simple implementations, particularly community-based delivery systems, could consider the use of an integrated software environment. Integrated software environments include the ability to store information found in traditional EDR systems, but also include the ability to use and store video sessions from within the software environment, text messages, and patient supplied information. They also include patient portals with the ability to capture patient data including on-line forms completion, uploading of images, and uploading of other patient-supplied information.

It is recommended that the data elements captured and stored in the EDR systems used use the same data model, coding, and terminology systems to allow interoperability among systems. In addition to the DICOM, ADA-HL7, X12, and ONC specifications mentioned earlier, implementation of ANSI/ADA Standard No. 1084 for Reference Core Data Set for Communication among Dental and Other Health Information Systems should be considered to assure interoperability at the data exchange level.[31]

Legal and Regulatory Considerations

As indicated earlier, the purpose of this technical report is to provide information for the profession on the developing field of teledentistry and assist providers in determining goals, selecting components, and creating working systems. Any use of this information must conform to the laws, regulations, and guidelines in the states and jurisdictions where the provider and patients involved are located. The purpose of this section is to highlight some areas of law and regulations that the provider should be familiar with in their local state and jurisdiction that will influence how they can use teledentistry system.

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[31] American Dental Association. ANSI/ADA Standard No. 1084 Reference Core Data Set for Communication Among Dental and Other Health-Information Systems. https://store.ada.org/catalog/ansiada-standard-no-1084-reference-core-data-set-for-communication-among-dental-and-other-health-d-62745.

Providers should review the laws and regulations in their state and jurisdiction and consult with their local professional societies and regulatory boards to obtain this information. Many states created "flexibilities" in their laws and regulations during the declared public health emergency (PHE) during the COVID-19 pandemic. Flexibilities included what services and/or teledentistry modalities can be performed and are eligible for public insurance reimbursement. As the PHE has ended in many areas there has been a variety of responses with some of those flexibilities remaining and others not remaining in existence.

It is also important to realize that laws, regulations, and guidelines related to teledentistry are evolving rapidly. This means that the provider needs to understand the policies in place in their state and jurisdiction and follow these policy areas to be informed of changes.

Scope of Practice

An area that impacts the ability and extent to which teledentistry can be used is the allowed scope of practice of allied oral health personnel in a specific jurisdiction. It is important for the provider to understand what dentists and allied personnel in their state and jurisdiction are allowed to do and under what circumstances. This includes:

- The ability to gather data including radiographic images that allows a dentist to perform a remote examination, diagnosis and treatment plan.
- The ability for a dentist to perform a remote examination, diagnosis and treatment plan.
- The ability for a dentist to supervise care at a distance.
- The ability for allied oral health personnel to perform various procedures in community locations independently or under various levels of supervision.
- Any variation in regulations based on the teledentistry modality being used (e.g, synchronous vs asynchronous).
- The ability to establish patients as patients of record using a teledentistry interaction and how that might vary based on the teledentistry modality being used (e.g, synchronous vs asynchronous).
- Whether any oral health procedures can be provided when the patients or provider is in one state and the patient is in another. In most states and jurisdictions the provider is required to be licensed in the state where the patient is when the services are provided. However, there are exceptions in some states, particularly for patients of record who may be temporarily out of the state where the provider is located.

HIPAA and the 21st Century Cures Act

HIPAA security and privacy regulations apply to data "at rest" (stored) in an electronic record system as well as to "data in motion" (exchanged) between electronic record systems. All HIPAA regulations and the federal regulations that implement the 21st Century Cures Act, apply to office-based transactions as well as teledentistry transactions. Extensive information about these regulations is available from many sources and is not included further in this document.

Billing and Reimbursement

As with other information in this document, rules for billing and reimbursement of oral health services provided in teledentistry systems vary across states and jurisdictions and delivery and reimbursement systems. The provider should investigate and understand the rules for their specific state and jurisdiction, delivery system, and reimbursement system. Some things to consider are the rules about the ability to bill for services provided in a teledentistry system based on:

- the type of procedure. In some states and jurisdictions and payment systems, certain specific procedures will be paid for when performed in a teledentistry system and other procedures will not be paid for.
- the teledentistry modality used. In some states and jurisdictions and payment systems, some procedures will be paid for when performed using certain teledentistry modalities and not paid for when performed using other teledentistry modalities.
- the setting in which the procedure is performed
- who performs the procedure – (e.g. dentist vs allied personnel)
- the type of payment system including:
    - Fee-for-service
    - Encounter
    - Capitation
    - Managed Care
    - Private commercial dental benefit plans
    - Public dental benefit plans such as Medicaid and others

"Provider-of-Record" Considerations

Some providers may be concerned about understanding who is the "provider of record" in a teledentistry system when different providers are in different locations and providing services for a patient. It may be useful to consider the obligation of any health care professional to maintain a record of services provided to any patient. Therefore, even in office-based practices, a patient may have multiple providers involved in their care and therefore multiple "providers of record." Sometimes the underlying question when this issue is raised is who has liability for the care of the patient. See the section below on Liability Coverage.

Liability Coverage

Any professional involved in the care of the patient has liability for the outcomes of services provided to that patient. Therefore, it is important that all the personnel involved in a team providing teledentistry services be covered under a professional liability policy. As with other issues addressed in this document, the rules about obtaining coverage and the type of coverage that may be obtained vary in different states and jurisdictions. It is recommended that the provider consult with their liability coverage carrier, legal advisor, or others, to understand the options for liability coverage when using teledentistry to provide oral health services.

Summary

The purpose of this technical report is to provide information for the profession on the evolving field of teledentistry and oral health care systems that use these technologies, and assist providers in determining goals, selecting components, and creating working systems. It includes information on definitions, coding and billing, uses of teledentistry in various locations, "use cases," data storage and exchange, components, and legal and regulatory issues.

This report does not provide all of the information a provider might need to fully design and operate an oral health system that incorporates teledentistry. Those interested in creating such systems are encouraged to use the information contained in this report as a starting point and seek additional support as they implement their system.

Appendix: Teledentistry Adoption Guide

The purpose of this Adoption Guide is to assist providers who are considering incorporating teledentistry in their practices or practice systems in making decisions about how they will use teledentistry, what arrangements they need to make, what hardware and software choices they could consider, and how they could organize a system that includes teledentistry as one of its components. The Guide is organized as a series of questions with links to various sections in this Technical Report where further information about the subject is addressed.

1. What population do you intend to serve using teledentistry?

    a. Patients in an existing practice with pre-and post-visit teledentistry interactions?
        i. If YES – As described in the section on Dental Offices and Clinics, even this type of interaction can take a variety of forms, but in many cases will require minimal new procedures, software, or equipment. See the sections on Advice and Referral, Record Sharing and Consultation, and Increasing Office Safety and Efficiency.

    b. Patients in an existing practice plus providing some limited services outside your current office or clinic locations?
        i. If YES – As described in the sections on Record Sharing and Consultation and Community-based Care – Limited Care, even limited care performed in the community can add a number of considerations in the adoption of teledentistry systems. It is critical that the provider or provider system carefully define the setting that will be served, the goals of the interactions in those settings, and the protocols and workflows needed to connect the activities in those settings to the office or clinic practice. See the sections on Operational Protocols, Workflows, Software, and Hardware that might be useful in these various situations

    c. People in community locations including pre-schools and schools, businesses, community centers, physician's offices, adult day programs and residential facilities, long term care facilities, and other types of health care facilities, correctional facilities, educational facilities, and social service facilities?
        i. If YES – As described in the sections on Community-based Care – Limited Care and Community-based Full-Service Care - Community-Engaged Systems the goals of serving people in these locations can vary from limited services in the community site to having the goal of trying to keep as many people healthy in the community location as possible and to require the fewest number of people to make a trip to the dental office as possible. It is critical that the provider or provider system carefully define the setting that will be served, the goals of the interactions in those settings, and the protocols and workflows needed to connect the activities in those settings to the office or clinic practice. See the sub-sections under Community-based Full-Service Care - Community-Engaged Systems for guidance about

Agreements with Community Sites, Legal and Regulatory Environment and Compliance Requirements, Roles and Responsibilities, EDR Considerations, IT and Connectivity Considerations, Protocols and Workflow, and Evaluation.

    d. Members of the public in a Call Center or Care Network Environment?
       i. If YES – some systems that engage members of the public may do so through advertising, referrals by benefit companies or relationships though existing medical or dental care networks. See the sections on The Call Center, Teleradiology, Integration with Other Health Systems, and Teledentistry Care Networks.

2. How will the Policy Environment in your state or jurisdiction influence the way in which you use teledentistry in the program you have in mind? There are several areas of policy to consider as described in the section on Legal and Regulatory Compliance.

    a. What are the laws, regulations, and policy guidance that determine allowable scope of practice for dentists and allied oral health personnel in your state or jurisdiction? See the section on Scope of Practice.

    b. Do the equipment, software, operational processes and workflows you intend to use conform to requirements related to protecting patient safety and privacy? See the section on HIPAA and the 21st Century Cures Act.

    c. How will the billing and payment rules and procedures in your state or jurisdiction and with various payers for care influence the way in which you do use teledentistry in the program you have in mind? See the section on Billing and Reimbursement.

    d. What do you need to consider in designing the workflow in your system and the relationship between various providers, records systems and determining who is the "provider of record" in a specific situation? See the sections on Provider-of-Record Considerations and Protocols and Workflow.

    e. Are there considerations or arrangements that need to be made to ensure that there is appropriate liability coverage for the system you are developing? See the section on Liability Coverage.

3. How will you design the specific care system and use of teledentistry you have in mind? Some things to consider are:

    a. Agreements - If you will serve people in community sites outside of your current office or clinic environments, do you already have a relationship with those sites? Do you have agreements that cover what you will do when you add teledentistry to your care system or do you need to create or modify existing agreements? See the section on Agreements with Community Sites.

b. Limited vs Full-Service Care in the Community - How comprehensive will the services be that you intend to offer outside of your current office or clinic environment? How will these services connect with your current office or clinic environment? See the sections on Community-based Care – Limited Care, Community-based Full-Service Care - Community-Engaged Systems, Integration with Other Health Systems, Teledentistry Care Networks, and Protocols and Workflow.

c. Personnel – Which personnel will be involved in the system and what will their roles and responsibilities be? It is important to consider the roles and responsibilities of the dentist(s) involved as well as that of oral health professionals in the office, office staff, oral health professionals working in the community, staff from community agencies and sites where services may be provided, and the roles and responsibilities of other health, education and social services professionals and systems which may be involved. See the sections on Agreements with Community Sites, Protocols and Workflow and Integration with Other Health Systems.

d. Enrollment – If you are serving people who are not currently patients in your existing office or clinic, how will you engage those patients in your care system? How will they be identified and notified about the system? What information will you need to collect to serve them? How will they be "signed up" as participants? Each of these are subjects worth considering and planning for separately and collectively. See the sections on Agreements and Roles and Responsibilities, and Enrollment.

e. Evaluation - How will you determine the effectiveness of the teledentistry system you design and operate? In some environments this may be optional. In others it may be required. However even in environments where understanding the outcomes and effectiveness of the system is optional, there are still benefits to doing so. See the section on Evaluation.

4. What equipment, software and connectivity systems will be used in the teledentistry system you are planning?

a. As described in multiple areas of this report, it is important to think about how all the components of the system you are designing will work together. It is possible to use various hardware and software systems that are not integrated with each other. While this approach can be made to work for simple systems, it is not the optimal environment for a sophisticated delivery system. It is recommended that providers who are considering developing more than simple implementations, particularly community-based delivery systems, consider the use of systems that use integrated hardware, software, and operational systems. See the sections on Hardware, Software, and Connectivity.

b. Another consideration related to the equipment, software and connectivity systems being selected is data storage and interoperability. While these are considerations for any oral health delivery system, they have some specific considerations when using teledentistry. See the sections on Electronic Data Exchange/Interchange (EDI) Standards Connectivity, and Data Storage.

c. As discussed in various sub-sections of the section on Hardware, it is important to consider how the various components in the chain of events in using videographic and photographic images in teledentistry system result in an image that contains the resolution, contrast, and color fidelity needed for the specific situation in which it being used. It is recommended that providers consider these factors in selecting and integrating components of their hardware, software, and connectivity environment. See the sections on Cameras, Videographic, Radiographic and Photographic Images, Computers, Monitors, Other Hardware Devices, and Connectivity.

5. What training, technical assistance, and implementation support will you need to design and operationalize the teledentistry system you have in mind?

a. As indicated in this report teledentistry can be incorporated in oral health care practices and practice systems in relatively simple ways. See the section on Advice and Referral. However, as the use of teledentistry expands to more sophisticated uses, especially when teledentistry is used to bring oral health services into community locations, the complexity of the systems expand as does the resultant need for integration. See the sections on Community-based Care – Limited Care, and Community-based Full-Service Care - Community-Engaged Systems. While oral health providers and practice systems may be capable of implementing simple systems, they may need training, technical assistance, and implementation support as the complexity of the system grows.

b. Some areas where oral health providers and practice systems may consider obtaining training, technical assistance, and implementation support include:
   - Determining populations and sites to be served
   - Developing agreements with community agencies and sites.
   - Designing systems to identify, engage, and enroll patients for their system.
   - Understanding and conforming to the policy environment in their state or jurisdiction
   - Selection and implementation of equipment, software systems, and connectivity systems
   - Integrating teledentistry systems with current office and clinic systems and operations.

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