



**POLICY RESEARCH REPORT**

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# **TELEDENTISTRY:** Innovation to Improving Access and Delivery to Oral Health Care Services in Dental Education

## INTRODUCTION

Telehealth is the use of electronic health information combined with telecommunication technologies to support and provide long-distance health care. As a broader scope of care, telehealth facilitates patient and professional education and nonclinical services and sustains public health efforts.<sup>1</sup> The COVID-19 pandemic and stay-at-home orders accelerated the rapid expansion of telehealth and its increased utilization.<sup>2</sup> Telehealth has become a practical option for patients and communities residing in health professional shortage areas<sup>3</sup> (HPSAs) to receive oral health care from the privacy of their home or a nearby clinical site in proximity to their residence. Teledentistry, a subcategory of telehealth, has become a commonly accepted form of oral health care delivery, including specialty dentistry,<sup>4</sup> and has played an important role in reducing health disparities and achieving equitable health.<sup>5,6</sup>

The practice of teledentistry emerged in 1994 from the U.S. Army's Total Dental Access Project, which provided evidence of reduced patient costs and increased access to dental services to rural and once inaccessible regions.<sup>7</sup> Teledentistry developed as four subunits: teleconsultation, telediagnosis, triage and telemonitoring. Through teleconsultation, patients or health care providers seek advice on dental treatment.<sup>8</sup> A primary use of teleconsultation has been regular dental check-ups that allow patients to maintain oral hygiene. It also allows for dentists to identify ailments that patients may not notice. Telediagnosis facilitates the exchange of images and videos, permitting dentists to make diagnoses, prescribe the appropriate at-home care<sup>6</sup> and refer patients to specialty dentistry resources when needed through triage.<sup>9</sup> This allows for the proper referrals to be made, which will limit unnecessary travel for patients, particularly those who live in rural areas. Telemonitoring reduces the number of in-person visits for patients who need frequent visits for the monitoring of an oral health



As the field of telehealth continues to expand, dental and allied dental students should be educated and trained in teledentistry before embarking on their journeys to practicing oral health providers.

ailment.<sup>10</sup> These four subunits of teledentistry help to decrease the amount of time and resources needed to expend for patients who face barriers to in-person preventive and oral health treatment.

Incorporating teledentistry into dental education provides several benefits to the career of the future dentist. First, the use of teledentistry is on a continuous upward trend, increasing its use by students as a form of care they may use in their careers.<sup>11</sup> When teledentistry is incorporated into didactic and clinical curricula, students will have ample education and training to acquire the skills necessary when they transition into practice. Another benefit of introducing teledentistry in dental school curricula is that it has resulted in positive attitude changes toward the use of teledentistry in addressing underserved communities.<sup>12</sup> By introducing teledentistry during dental school, students can build the skills required to properly deliver dental services through

the necessary, evolving technology.<sup>13</sup> As the field of telehealth continues to expand, dental and allied dental students should be educated and trained in teledentistry before embarking on their journeys to practicing oral health providers.

Teledentistry is complex and requires a broad overview of its various elements. This report outlines state regulations and reimbursement mechanisms for teledentistry, the role of teledentistry in minimizing oral health disparities through practice and dental education and teledentistry's compliance with the Health Insurance Portability and Accountability Act

of 1996 (HIPAA) for the prevention and treatment of oral health diseases. The goal of this policy research report is to provide educators with the information necessary about the benefits of including teledentistry in dental education and continuing to expand this important field.

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## STATE REGULATIONS, REIMBURSEMENT AND SCOPE OF PRACTICE

Access to preventive oral health services is complex and partially dependent on health care coverage. Most dental services are Medicaid-eligible for individuals under the age of 21 as a requirement of the Early and Periodic Screening, Diagnostic and Treatment benefit.<sup>14</sup> As of November 2020, more than 39.2 million adults and 37.5 million children were enrolled in Medicaid, and more than 6.5 million children were enrolled in the Children's Health Insurance Program (CHIP).<sup>15</sup> Although 43% of U.S. dentists participate in Medicaid or CHIP for child services in 2019,<sup>16</sup> only about 20% of the children under age three enrolled in Medicaid get a dental visit for preventive services.<sup>17</sup> The situation for adults participating in Medicaid is even more complicated. State Medicaid systems may provide coverage for emergency dental services for adults, but there is no minimum requirement for adult dental coverage through Medicaid. (This also varies by state.<sup>18</sup>) In addition to state licensure rules and regulations, the implementation of teledentistry nationwide also faces barriers due to reimbursement policies from private insurers and Medicaid.

The reimbursement of dental services rendered through teledentistry vary widely state to state.

Some state Medicaid systems have instituted policies that allow for the reimbursement of synchronous (real-time encounter) and asynchronous (information stored for subsequent review) teledentistry services, while others may reimburse for one or the other, or not at all.<sup>19</sup> Other state Medicaid programs and private insurers allow the reimbursement of teledentistry services equivalent to face-to-face contact.<sup>20</sup>

The American Dental Association's (ADA) development of two Current Dental Terminology (CDT) codes in 2018, D9995 (synchronous encounters) and D9996 (asynchronous encounters), helped facilitate teledentistry as a reportable service and subsequently, to be reimbursable.<sup>21</sup> These codes helped introduce teledentistry as an oral health benefit for Medicaid and private insurance beneficiaries.

Health care communications and transactions, including telehealth, are subject to the regulations in HIPAA, which established national standards for "electronic health care transactions and codes sets, unique identifiers and security."<sup>22</sup> HIPAA requirements were developed to ensure patient identifiers were protected and that communications with patients outside of the in-person visit were conducted securely.

“ [Teledentistry] can be a **great resource** for patients who live far away from a dental practitioner.”

— Dental Student 1, University of Minnesota School of Dentistry

In recognition of the need for access during a pandemic and the utility of telehealth to meet some of these immediate needs, modifications were made to the HIPAA rules during the public health emergency. The Department of Health and Human Services' Notification of Enforcement Discretion indicated that “covered health care providers will not be subject to penalties for violations of the HIPAA Privacy, Security, and Breach Notification Rules that occur in the good faith provision of telehealth during the COVID-19 nationwide public health emergency.”<sup>23</sup>

## TELEDENTISTRY AND ACCESS TO CARE FOR UNDERSERVED POPULATIONS

Structural barriers and social inequalities, such as access and affordable oral health care, poverty, geographic remoteness, low oral health literacy and poor or no public transportation, are contributors to oral health disparities. Racial and ethnic minorities, patients with special health care needs, low-income communities, children and populations residing in rural and underserved

This provision also allowed practitioners and health care entities to use platforms that are not HIPAA compliant but were readily available to clinicians and patients.<sup>24–26</sup> It remains to be seen what aspects of these less stringent use parameters may prevail beyond the end of the pandemic.

Although teledentistry has been shown to expand dental care delivery, its delivery varies across the United States due to state regulations on licensing and scope of practice. Each state has legal jurisdiction over licensing and practice of dental care, and this regulatory oversight is primarily conducted by state-specific dental boards.<sup>27</sup> According to the 2020 ADA policy on teledentistry, dentists and allied dental personnel who provide services through teledentistry modalities should be licensed or credentialed by the state in which the patient receiving services resides.<sup>28</sup> Each state licensing agency must provide its own teledentistry implementation guidelines and define its scope of practice to help practitioners comply with state telemedicine laws. The National Conference of State Legislatures recommends teledentistry proponents to become aware of existing telehealth policies and engage with state dental boards and other stakeholders to identify existing barriers to teledentistry.<sup>29</sup> Addressing these barriers will be consequential in reaching vulnerable communities facing significant impediments to equitable oral health care.

areas are significantly impacted by these disparities.<sup>30</sup> Additionally, oral health disparities can also be attributed to the scarcity of dentists and oral health providers in rural and remote areas. The Health Resources and Services Administration (HRSA) estimate that approximately 62 million Americans reside in 6,678 dental HPSAs in the United States.<sup>31</sup> It is estimated that 10,882 oral

health practitioners are needed to address the shortage in oral health and dental specialty access.<sup>32</sup> Teledentistry provides an opportunity to minimize the gap in prevailing oral health care disparities by meeting the oral health workforce void in remote and rural areas.



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Teledentistry technology offers improved opportunities for oral health services in underserved communities. With the ability to exchange electronic medical information through secured web servers and to enhance interprofessional and intraprofessional coordination between dentists, dental hygienists, other oral health providers and nonoral health providers, teledentistry allows communities in remote areas to receive support, education and comprehensive care related to oral health.<sup>33</sup>

In 2010, dentists and dental educators from the Pacific Center for Special Care at the University of the Pacific, Arthur A. Dugoni School of Dentistry (Dugoni School) used teledentistry to create the first “Virtual Dental Home” to improve the oral health of children and adults of low-income households in California.<sup>34</sup> Additional models to reach the underserved communities have been implemented by

other academic dental institutions. The University of Minnesota School of Dentistry’s (U of M SOD) teledentistry network established in 2004 links university specialists to dentists and patients at community-based clinics in remote rural areas.<sup>35</sup> This remote, community-clinical linkage assists with specialty consultations in oral medicine and orofacial disorders, decreases the distance patients travel to a specialty clinic and reduces average hours missed in school-aged children.<sup>36</sup>

Building upon the “Virtual Dental Home” model, the dental hygiene profession has also been a leader in delivering teledentistry services. For example, teledentistry modality promotes the use of dental hygienists and advanced practice hygienists to screen for oral health conditions and provide medical history review prior to communication with dentists in remote areas.<sup>37</sup> The Idaho State University Department of Dental Hygiene is a prime example of expanding oral health services in dental HPSAs through the Bengal Smiles for Life teledentistry program. With funding from the HRSA, Bengal Smiles for Life provides hands-on education and training to dental hygiene students while helping to prevent oral health diseases in vulnerable individuals across the life span.<sup>38</sup> However, despite the role of dental hygienists and other oral allied health professions, the scope-of-practice requirements in each state may limit the capacity of these professionals to provide teledentistry services that are reimbursable.<sup>39</sup> Therefore, it is important to foster collaboration between the dental and allied dental workforce and state boards of dentistry and payers to offset the challenges that may arise across the nation to improve oral health disparities.

Teledentistry is instrumental in preventing oral health diseases in children. Data from the Centers for Disease Control and Prevention indicate that dental caries is the most prevalent chronic disease in children aged 6-11 years and adolescents 12-19 years.<sup>40</sup> These disparities are more prevalent

in school-aged children from rural and disadvantaged environments. Since its inception in 2004, the teledentistry program at Eastman Institute for Oral Health at the University of Rochester Medical Center has reached 1,500 preschool and elementary school children from underserved urban and rural areas in New York.<sup>41</sup> Through synchronous teleconsultation, a study in a rural New York pediatric population identified approximately 93% of children with a range of oral health needs, and led to delivery of various dental treatments, such as dental restorations and extractions.<sup>42</sup> The use of teledentistry screenings in young children underscores the importance of alternative technological screening modalities when face-to-face encounters are not feasible.

Patients with special health care needs are another vulnerable population with unmet dental care. Children and adolescents with special health care needs (CASHCN) are more likely to have tooth decay than those without special health care needs. CASHCN are also at a higher risk for poor oral health outcomes.<sup>43</sup> For example, results from the

2016-2018 National Survey of Children's Health indicate that 16% of CASHCN had higher rates of dental caries compared to 11% of non-CASHCN. Comparative oral health disparities in the adult special health care needs population are also observed, especially adults living in institutional settings.<sup>44</sup>

Only 23% of dental students had teledentistry clinical experiences by graduation.



The use of teledentistry technology was found to be feasible and acceptable among patients with special health care needs,<sup>45</sup> further arming oral health care providers with a tool to addressing health disparities in this population.

## THE INTEGRATION OF TELEDENTISTRY IN DENTAL EDUCATION

Education and training in the use of teledentistry varies across dental education schools and programs. Dental schools and programs aim to prepare graduates to be practice ready. Preparing a student to be practice ready entails not only didactic learning, but also includes significant simulation of clinical procedures and many hours of providing patient care under the supervision of qualified faculty. In determining if schools and programs should engage in teledentistry, both the didactic and clinical elements should be considered. While a lecture course in teledentistry would inform and educate the student, the experience of clinical application prepares the student to employ teledentistry in their future practice. Currently, there

are no Commission on Dental Accreditation (CODA) or Liaison Committee on Medical Education (LCME) standards that address telehealth and teledentistry. However, the Association of American Medical Colleges has produced a series of telehealth competencies addressing patient safety and appropriate use, access and equity, communication, data collection and assessment, technology and ethical practices and legal requirements.<sup>46</sup>

In a study conducted in 2019, academic deans at 16 U.S. dental schools distributed a survey to identify factors, such as knowledge, experience and socio-demographic characteristics of fourth year dental students' intention to use teledentistry in practice.

The study demonstrated a relationship between exposure to teledentistry in school and intention to use it in practice. The study also revealed that only 23% of dental students stated they had teledentistry clinical experiences while 50% indicated they did receive lectures on this topic.<sup>47</sup>

In conjunction, the University of North Carolina at Chapel Hill convened a statewide teledentistry summit in which participants' understanding of teledentistry; its benefits, challenges and solutions; and the role of dental hygienists were assessed by pre- and post-summit surveys. Responses indicated that self-reported knowledge was high and attitudes favorable for moving teledentistry forward in North Carolina with the notation that state practice acts restricting dental hygienist participation must be addressed.<sup>48</sup> Recently, teledentistry was codified in North Carolina law.<sup>49</sup>

A recent article in the *Journal of Dental Education* highlighted two different viewpoints of the faculty authors as to whether dental schools should incorporate teledentistry into the curricula.<sup>50</sup> On the proponent side, several key reasons were cited, including the need for graduates to be adept at this emerging modality; the potential impact on access to care and to specialty consultation for those in remote or rural areas; the reduction of cost of care by saving time and travel; and the increased access to screening, monitoring and limited treatment for vulnerable and underserved populations. Finally, the potential for increasing interprofessional collaborative care was cited as a positive reason for curricula incorporation.

In the argument against incorporating teledentistry into dental school curricula, the main concerns expressed were impracticality at the dental student level; an already overcrowded curriculum; shortage of faculty; associated financial costs and viability, such as technology and reimbursement; and legal unknowns, such as licensure restrictions, HIPAA and the like.

“Using [teledentistry] allowed the patient to stay home, which can be safer during COVID-19. This platform also allows the patient to get advice from the dentist on what to do in the meantime, before they can see the dentist.”

— Dental Student 2, University of Minnesota School of Dentistry

Given that teledentistry is not specified in an accreditation standard, it is up to each school or program to determine if and how teledentistry will be integrated into the curriculum, including patient care. The use of teledentistry by dental schools and programs preceded the pandemic and additional schools adopted it during the pandemic.<sup>51-58</sup> The Dugoni School and U of M SOD have offered lessons learned and best practices on the role of teledentistry in dental pedagogy.

During the COVID-19 pandemic, the use of teledentistry at the Dugoni School spanned across academic specialty dental departments. “During the pandemic, we had to think of how to enhance dental consultation at our school with patients and do follow-up treatment,” said Heesoo Oh, D.D.S., Ph.D., M.S.D., Professor and Chair of the Department of Orthodontics at the Dugoni School. During the pandemic, virtual

tours were provided to patients so they could become familiar with the School, meet faculty and help faculty understand their oral health care needs.

Joorok Park, D.M.D., M.S.D, Assistant Professor at the Dugoni School and Orthodontic Clinic Director at the Redmond Family Orthodontic Clinic also shared two valuable purposes of teledentistry: triage and follow-up appointments. Dr. Park stated that “new patients were scheduled via Zoom for Healthcare, a HIPAA compliant platform.” Through this, patients were screened and guided through Zoom and conducted follow-up monthly appointments with the orthodontic team. Dr. Park elaborated that teledentistry allowed patients to adhere to the treatment process and not feel abandoned through these challenging times. Furthermore, through the teledentistry rotation in the Extramural Patient Care (Community Practice Systems) course, dental students develop competency in patient management skills to maximize patient satisfaction using virtual tools and understand how to appropriately execute “webside manner” needed to deliver care virtually, said Michelle Brady, D.D.S., Assistant Professor and Coordinator of Interprofessional Education at the Dugoni School.

Through community-based dental clinics and programs at the Dugoni School, dental hygiene students are also exposed to teledentistry. Lory

Laughter, RDH, M.S., Program Director for Dental Hygiene at the school, says that teledentistry technology links dental hygiene students to underserved and underresourced communities for the provision of oral health preventive and screening services. Throughout their education at the Dugoni School, dental hygiene students become integral members of interprofessional and intraprofessional teams, and teledentistry is an added value to their training and education.

In response to the COVID-19 pandemic public health emergency, U of M SOD enhanced its teledentistry protocols in the Department of Pediatric Dentistry. During the pandemic, “teledentistry was used as an adjunct to emergency care for our academic pediatric dental clinic processes,” said Elise Sarvas, D.D.S., M.S.D., M.P.H., Clinical Associate Professor of Pediatric Dentistry at U of M SOD. Like the Dugoni School, U of M SOD also used teledentistry for triaging and pre-scheduling appointments. Dr. Sarvas also added that “we developed tools to help families take diagnostic photos using a cell phone with flash and a pair of spoons” that would be uploaded through a secure server (FIGURE 1). The Department of Pediatric Dentistry also built a website in April 2020 for intake and video conferencing with patients. As dental clinics reopened with limited capacity in the summer of 2020, teledentistry remained an integral part of the pediatric dental

**FIGURE 1**  
**Pediatric Dentistry Tools for Virtual Diagnostic Photography**

**#1 FRONT VIEW**



Have the child bite down naturally with their back teeth touching, directly facing the camera. Try to get as many teeth as you can in the picture. Pull their lips and cheeks away from their teeth with the spoons, to show more teeth.

**#2 LOWER TEETH**



Have the child open their mouth wide and tilt their chin slightly downward towards their chest. Make sure the biting surfaces of all lower teeth are showing.

**#3 UPPER TEETH**



Have the child open their mouth wide and lift their chin as much as they can upwards. Make sure the biting surfaces of all upper teeth are showing.

**#4 CLOSE UP**



Have the child open their mouth wide and use the spoons to make the area of concern (tooth, gum, appliance, etc.) as visible as possible. Get as close to the area as you can while still making sure the photo is in focus.

emergency call, and predoctoral dental students were introduced to a teledentistry block in the 3.5-week rotation in pediatric dentistry. Furthermore, teledentistry remained an integral component in partnership with federally qualified health centers and community health clinics for the delivery of oral health care services to remote areas in Minnesota.

## CONCLUSION

The application of teledentistry continues to evolve. With social distancing guidelines and protocols brought on by the COVID-19 pandemic, the use of teledentistry has opened the doors to reaching vulnerable populations of greatest oral health care needs. Despite varied state regulations and reimbursable mechanisms by Medicaid programs and private insurers, its utility has confirmed to have long-term impact in oral health. Health delivery systems, oral health stakeholders and policymakers have a critical role in ensuring teledentistry's parity is achieved to continue delivering optimal oral health services. Looking into the future, academic

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The use of teledentistry has opened the doors to reaching vulnerable populations of greatest oral health care needs.



dentistry will be pivotal in educating and training the dentists of tomorrow on teledentistry modalities and offering a new perspective on the delivery of oral health care.

Heesoo Oh, D.D.S., Ph.D., M.S.D., Professor and Chair of the Department of Orthodontics; Joorok Park, D.M.D., M.S.D, Assistant Professor and Director of the Redmond Family Orthodontic Clinic; Michelle Brady, D.D.S., Assistant Professor and Coordinator of Interprofessional Education; and Lory Laughter, RDH, M.S., Program Director for Dental Hygiene as well as Elise Sarvas, D.D.S., M.S.D., M.P.H., Clinical Associate Professor of Pediatric Dentistry at the University of Minnesota School of Dentistry for sharing their knowledge, insights and expertise.

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