



## Case Studies of 6 Innovative Oral Health Service Delivery Programs Using Tele-dentistry

**Description and Policy Relevance:** Tele-dentistry is an emerging area of oral health service delivery that links telecommunications with dentistry, often involving clinical information and image exchanges to enable consultation and treatment. The term “tele-dentistry” was introduced in 1977 and defined as “the practice of using video-conferencing technologies to diagnose and provide advice about treatment over distance.”<sup>1</sup> It is widely acknowledged that tele-medicine has served as the foundation for this innovative approach to oral health service delivery and is used particularly in rural communities, allowing providers to use available technology to send graphics, data, and audio-visual images to other providers for consultation and diagnosis.<sup>2</sup> A more recent application of teledentistry is its use in remote supervision.

One of the earliest tele-dentistry initiatives was part of the U.S. Army’s Total Dental Access Project which began in 1984. The project reported a number of positive outcomes, including cost-effective oral health services that increased access to care. Despite this initial success, the uptake of tele-dentistry has been relatively limited for reasons that are not well understood.<sup>3</sup> However, there are a small number of programs that have successfully integrated tele-dentistry into oral health service delivery. Assessments of these programs indicate that tele-dentistry is an efficient strategy for treating school-age children showing signs of early childhood caries;<sup>4</sup> that tele-dentistry can improve providers’ ability to find treatment options for remote patients and to connect patients and their providers to dental specialists;<sup>5</sup> and that tele-dentistry is an effective strategy to coordinate with children’s caregivers and specialty dentistry clinics for needed oral health services.<sup>6</sup>

Tele-dentistry has been adapted for a variety of service models such as primary care dentistry or expanded function dental hygiene. Preliminary research examining tele-dentistry practices finds that it is a potentially effective tool in which oral health professionals coordinate with each other to plan and deliver oral health care that produces better oral health outcomes.

**Hypotheses, Design, and Analysis:** The hypothesis for this study is that tele-dentistry is an emerging strategy with the potential to improve oral health outcomes for underserved populations, particularly those living in rural communities. The OHWRRC proposes to conduct six case studies of innovative oral health programs in different states that employ tele-dentistry. Preferred case study participants include oral health programs operated by Federally Qualified Health Centers or other safety net oral health providers that employ tele-dentistry strategies. The case studies will explore the tele-dentistry approaches used, how they are funded, their workforce configurations- both for clinical staff and health information technology (HIT) staff; examine impacts on oral health outcomes to the extent data are available to support such an assessment; and identify barriers and facilitators (eg, reimbursement policies, health professions regulations, etc.) to the use of tele-dentistry services. The case studies will entail site visits to selected programs and in-depth interviews with both administrative, HIT and clinical staff at selected sites where tele-dentistry services are provided. Protocol questions will focus on the application of tele-dentistry services, barriers and facilitators of its use and impacts on populations served. Protocol questions will be developed in collaboration with other Health Workforce Research Centers (HWRCs) engaged in similar qualitative studies of electronic health records and HIT workforce

strategies.

In addition, OHWRC researchers will analyze any utilization data available from the 6 case study programs in order to more fully assess the impacts of tele-dentistry on service delivery and access. The researchers will also examine the statutes, regulations and state level reimbursement policies related to the provision of tele-dentistry services. In addition, the researchers will identify the oral health professionals allowed to provide and bill for tele-dentistry services in the 6 case study states. An emerging area of tele-dentistry, remote supervision, may support expanded access to oral health services provided by, among others, dental therapists and dental hygienists. This analysis will provide a better understanding of statutory and regulatory parameters that support the use of tele-dentistry services.

Efforts will be made to work collaboratively with the other HWRCs that are also conducting HIT studies in order to better understand common themes related to the uptake of technology in the provision of health and oral health services.

**Data Sources:** The OHWRC will complete six case studies of oral health programs using tele-dentistry in six different states. In addition, the OHWRC will review current state statutes and regulations in dentistry with specific focus on regulation of tele-dentistry and state-level reimbursement policies for oral health providers accepting Medicaid and/or commercial insurance for services provided using tele-dentistry.

**Human Subjects Research:** The research will be supervised by the Institutional Review Board of the New York State Department of Health.

**Deliverables:** The findings from this research study will be presented in six case study briefs describing the tele-dentistry program applications; workforce strategies; impacts on access to care; the organizational structure in which services are provided, and the barriers and facilitators of tele-dentistry services. The OHWRC will prepare a technical report on the findings from this project. OHWRC researchers will work with researchers from the other HWRCs engaged in telehealth focused projects to develop a collaborative dissemination plan on shared findings from this work. Strategies may include peer reviewed journal publications, research briefs as well as panel presentations at major workforce research conferences including the annual AAMC health workforce research conference and Academy Health Research Meeting.

#### References:

1. Friction J, Chen H. Using tele-dentistry to improve access to dental care for the underserved. *Dent Clin North Am.* 2009; 53: 537-48.
2. Jampani, ND, Nutalapati R, Dontula, BSK, Boyapati R. Applications of tele-dentistry: a literature review and update. *J Int Soc of Prev & Com Dent.* 2011; 1: 37-44.
3. In 1994, tele-dentistry was used in the assessment of 15 patients who were referred for periodontal surgery to a clinic 120 miles away from where they lived. Referral was based on the intraoral images captured and sent with the assistance of a dental image management system to the specialist clinic. Periodontal surgery was conducted following surgical procedures, suture removal was successfully conducted in the patients' local town clinic. New images were again captured and sent to the specialist's clinic. Results of the study indicated that 14 out of 15 patients avoided a return trip to the specialist clinic and stated they had received good care. See Rocca MA, Kudryk VL, Pajak JC, Morris T. The evolution of a tele-dentistry system within the Department of Defense. *Proc AMIA Symp.* 1999: 921-924.
4. Kopycka-Kedzierawski D, Billings RJ, McConnochie JM. Dental Screenings of preschool children using tele-dentistry: A feasible study. *Pediatr. Dent.* 2007; 29:209-213; Kopycka-Kedzierawski D, Billings RJ. Tele-dentistry in inner-city child-care centres. *J Telemed. Telecare.* 2006; 12: 176-181; Kopycka-Kedzierawski D, Bell CH, Billings RJ. Prevalence of dental caries in Early Head Start children as diagnosed using tele-dentistry. *Pediatr. Dent.* 2008; 30: 329-333.
5. Chang SW, Plotkin DR, Mulligan R, Polido JC, Mah JK, Meara JG. Tele-dentistry in Rural California: A USC initiative. *J Calif Dent Assoc.* 2003 Aug; 31(8):601-8.
6. Summerfelt, FF. Tele-dentistry-assisted, affiliated practice for dental hygienists: An innovative oral health workforce model. *J Dent Educ.* 2011(6): 733-742.