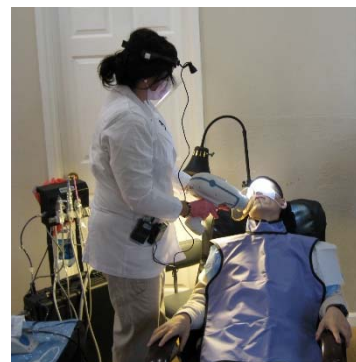
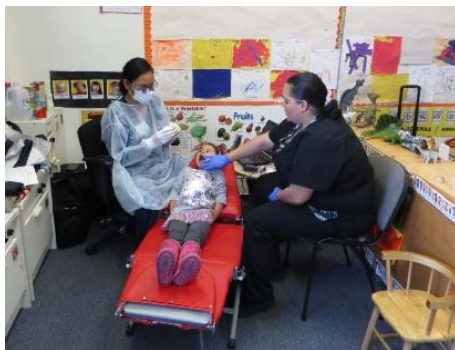


## Report of the Virtual Dental Home Demonstration

Improving the Oral Health of Vulnerable and Underserved Populations  
Using Geographically Distributed Telehealth-Connected Teams

June 14, 2016



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## Report of the Virtual Dental Home Demonstration

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## Introduction

The Pacific Center for Special Care at the University of the Pacific School of Dentistry (Pacific) has developed and directed a six year demonstration of a new system for improving the oral health of groups in the U.S. population that do not get dental care on a regular basis and have high rates of untreated dental disease. This system is called the Virtual Dental Home (VDH). The name of this system of care indicates that it provides all the essential ingredients of a “health home”, which means it focuses on creating oral health, but does so using geographically distributed, telehealth-connected teams.<sup>1</sup> As opposed to “dental home” systems that consider that the dental office as the “home”, this model reaches people that do not regularly visit dental offices by bringing services to community settings. It emphasizes prevention and early intervention services in those settings, and links and expands the involvement of dental offices and clinics with those groups and in those settings.

This report is a summary of the six year demonstration of the VDH system. While it does not contain all the data and detailed results of this demonstration, it is intended to provide an overview of the system, major accomplishments, lessons learned, and future directions.

## Why Is A New System of Oral Health (Dental Care) Needed?

Many people in the U.S. face serious obstacles in obtaining dental services. These barriers result in severe oral health disparities in many groups which are related to income, age, ethnicity, geography, and medical, physical or social conditions.<sup>2,3,4,5</sup> Even in urban areas and in middle class healthy groups, the majority of people do not get dental care on a regular basis, with many people accessing the dental care system only for treatment of emergency problems or seeking treatment of advanced disease, pain or infection in hospital emergency departments or operating rooms.<sup>6,7,8,9,10</sup>

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1. American Academy of Pediatrics. Role of the medical home in family-centered early intervention services. Council on Children With Disabilities. *Pediatrics* 2007;120(5):1153-1158.
  2. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.
  3. Healthy People 2020. HealthyPeople.gov. <http://www.healthypeople.gov/2020/default.aspx>. Accessed October 23, 2015.
  4. The Institute of Medicine. *Advancing Oral Health in America*. 2011. The National Academies Press. Washington D.C.
  5. The Institute of Medicine and the National Research Council. *Improving access to oral health care for vulnerable and underserved populations*. 2011. The National Academies Press. Washington D.C.
  6. American Dental Association Health Policy Resources Center. *Dental Care Rate Highest Ever among Children, Continues to Decline among Working Age Adults*. October 2014.
  7. American Dental Association Health Policy Institute. *Research Brief: Emergency Department Use for Dental Conditions continues To Rise*. April 2015.
  8. California Health Care Foundation. *Emergency Department Visits for Preventable Dental Conditions in California*. 2009.
  9. California Health Care Foundation. *Emergency Department Visits and Hospitalizations for Ambulatory Care Sensitive Dental Conditions*. 2008.
  10. The Pew Children’s Dental Campaign. *A Costly Dental Destination: Hospital Care Means States Pay Dearly*. February 2012.

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In California, it has been estimated that over 35% or more of the population, or almost 12 million children and adults are not able to get their oral health needs met through the traditional dental care system. The proportion of those not getting care in the tradition dental care system is much higher for people in racial and ethnic minority groups, people with disabilities, individuals with lower incomes and those living in rural areas.<sup>11</sup> For example, for children, where fees in the California Medicaid dental program average less than one-third of the fees in private dental benefit plans, only 29% of dentists participate in the California Medicaid program and only 45% of children have even one annual dental visit. As a result, they have significantly worse oral health than those in other segments of the population.<sup>6</sup>

Pacific has designed the VDH system to address the significant health disparities described above by delivering oral health services in locations where people live, work, play, go to school and receive educational and social services. Pacific partnered with a number of funding organizations, providers and community organizations to implement this demonstration project to bring much-needed oral health services to these underserved populations. These populations range from children in Head Start Preschools and elementary schools to older or disabled adults in residential care settings, nursing homes, and sub-acute hospital settings.

Now in its seventh year of delivering much needed oral health services to California's most vulnerable and underserved citizens, the Virtual Dental Home has proven to be a safe, effective, and cost-effective system.

## **What is a Virtual Dental Home?**

The Virtual Dental Home (VDH) is a community-based oral health delivery system in which people receive preventive and early intervention therapeutic services in community settings. It utilizes telehealth technology to link allied dental personnel in the community with dentists in dental offices and clinics. Pacific has demonstrated that registered dental hygienists in alternative practice (RDHAP), dental hygienists working in public health programs (RDH) and registered dental assistants (RDA), working in telehealth-connected teams, can keep most people healthy in community settings by providing education, triage, case management, preventive procedures, and Interim Therapeutic Restorations (ITR). Where more complex dental treatment is needed, the Virtual Dental Home connects patients with dentists in the area. In 2014, as described later in this document, legislation was adopted in California which defined the categories of allied dental personnel allowed to participate in this system as including RDHAPs, RDHs and Registered Dental Assistants in Extended Functions (RDAEF), collectively refer to in the remainder of this document as allied dental personnel.

This system promotes expansion of dental practices and linkages between dentists in dental offices and these community-based allied dental personnel. Most importantly, it brings much-needed services to individuals who might otherwise receive no care.

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11. American Dental Association Health Policy Institute. The Oral Health Care System: A State-by-State Analysis.. 2015.

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“ The VDH is located in the exact community that it serves. Access to health services is always improved when the services provided are in your own neighborhood. – VDH Site Administrator

## How Does it Work?

This model relies on the advanced training and community-based practice of allied oral health personnel and telehealth linkages to dentists. In the VDH Demonstration, the allied dental personnel worked for or were linked with and collaborated with a dentist in their community to provide care using telehealth technology and telehealth-connected teams.

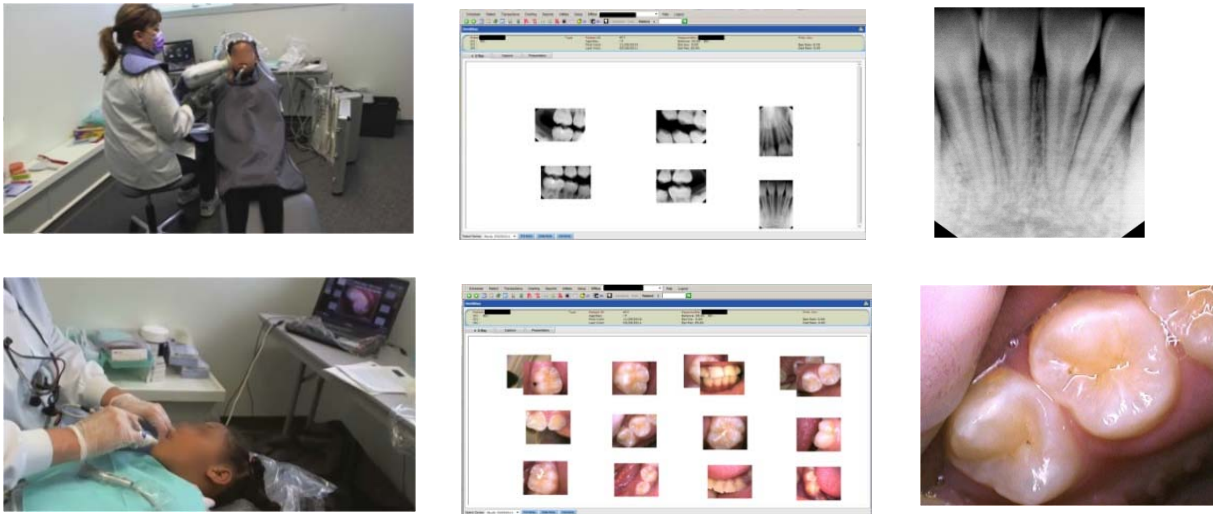


Figure 1: Sample Photographs and Screen Captures from an Electronic Health Record System

Equipped with portable imaging equipment and an internet-based dental record system, allied dental personnel collect electronic dental records such as X-rays, photographs, charts of dental findings, and dental and medical histories, and upload the information to a secure website where they are reviewed by the collaborating dentist. Some sample photographs and screen captures from a cloud-based electronic record system called Denticon, which was used in this demonstration, are presented in Figure 1.<sup>12</sup> The dentist, who is not at the community site, reviews the patient's information and creates a dental treatment plan. The allied dental personnel perform procedures that can be conducted in the community setting within their allowed scope of practice and with the timing and level of supervision allowed or required by their license. The services they provided include:

- Health promotion and prevention education,
- Dental disease risk assessment,
- Preventive procedures such as application of fluoride varnish, dental sealants, and for dental hygienists, dental prophylaxis and periodontal scaling,
- Placement of interim therapeutic restorations (ITR) when instructed to do so by a dentist,

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12. Planet DDS. Denticon Practice Management Software. <https://www.planetdds.com>.

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- Tracking and supporting the individual's need for and ability to obtain additional and follow-up dental services, and
  - Supporting increased awareness of oral health and adoption of healthy behaviors in the community environments where they worked, and integration of oral health into the processes and activities of these community organizations.

It should be noted that “Interim Therapeutic Restoration” is the term developed by the American Academy of Pediatric Dentistry in its *Policy on Interim Therapeutic Restorations* (ITR).<sup>13</sup> As described in that document, this term is used to describe the technique referred to more broadly in the literature as Atraumatic Restorative Technique (ATR). The AAPD recommended the term ITR to emphasize the provisional nature of the restoration and the need for the restoration to be monitored by a dentist.

After the dentist reviews the electronic dental records, and if the dentist determines that the patient needs treatment beyond what can be delivered in the community site, the allied dental personnel refer patients to dental offices for procedures that require the skills of a dentist and help the patient arrange for and keep appointments. When such visits occur, the patient arrives with health history and consent arrangements completed, a diagnosis and treatment plan already determined, preventive procedures completed and improved preventive practices. The patient is likely to receive a successful first visit with the dentist as the patient's dental records and images have already been reviewed and significant desensitization to dental treatment has occurred in the community setting. These elements lead to a more successful referral.

In some cases the dentist may come to the community site and use portable equipment to provide restorations or other services that only a dentist can provide. In either case, patients are seen at a frequency determined by their oral health risk level and needs, and the majority of patient interactions and efforts to keep people healthy are performed by the allied dental personnel in the community, thus creating a true community-based dental home. A diagram of the model is included in Figure 2.

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<sup>13</sup> American Academy of Pediatric Dentistry. Policy on Interim Therapeutic Restorations (ITR). Adopted 2001. Revised 2004, 2008. [http://www.aapd.org/media/Policies\\_Guidelines/P\\_ITR.pdf](http://www.aapd.org/media/Policies_Guidelines/P_ITR.pdf).

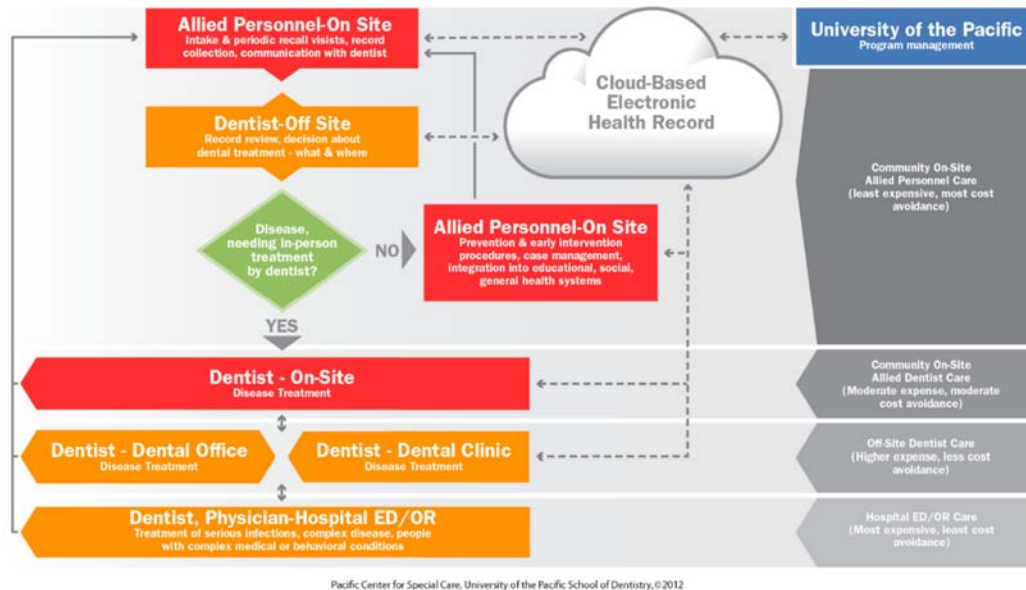


Figure 2: The Virtual Dental Home Concept Model

## The Virtual Dental Home Demonstration

The VDH demonstration was conducted from 2010 to 2016. It was a largely grant funded “proof-of concept” demonstration that also tested and collected data on a number of elements of the delivery system and its outcomes. Approximately 27 funders provided over \$5.5 million to support this demonstration in 11 communities and approximately 50 sites across California. The communities, populations and major partners are listed in Table 1. In addition to testing the ability of dentists and allied dental personnel to function in telehealth-connected teams and create Virtual Dental Homes, the demonstration also tested the safety and efficacy of two procedures that were not formerly within the scope of practice of allied oral health personnel.

COMMUNITY	POPULATION AND MAJOR PARTNERS
Sacramento	Elementary school-based facilities working with community dentists
San Francisco	Head Start Preschools working with a health center
Visalia/Fresno	Nursing home facilities working with community dentists
San Diego	Head Start Preschools and Elementary schools working with a health center
Eureka	Residential facilities for people with disabilities working with a health center
Alameda and Contra Costa Counties	Residential facilities for people with disabilities working with community dentists
San Benito, Santa Clara and Santa Cruz Counties	Residential facilities for people with disabilities working with community dentists
San Mateo County	Residential facilities for people with disabilities working with community dentists and Head Start Preschools working with a health center
Pacoima	A community center for low-income people working with community dentists
Los Angeles County	Head Start Preschools and Elementary schools working with a health center
Los Angeles County	Residential facilities for low income seniors working with a health center

Table 1: VDH Demonstration Sites, Populations, and Partners



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## Health Workforce Pilot Project Authority

As a part of the Virtual Dental Home demonstration, Pacific applied for authority under the California Health Workforce Pilot Project (HWPP) mechanism, administered by the California Office of Statewide Planning and Development (OSHPD).<sup>14,15</sup> This authority allowed Pacific to test the ability of allied dental personnel to decide which radiographs to take in order to facilitate an oral evaluation by a dentist and to place ITRs under general supervision of dentists. These procedures expanded the ability to create geographically distributed telehealth-connected teams and to improve the oral health of the vulnerable and underserved populations participating in the Virtual Dental Home demonstration.

## Results

The results of the Virtual Dental Home (VDH) demonstration are presented here in several categories.

### Patients, procedures and visits

The Virtual Dental Home (VDH) demonstration started patient care in July 2010. In December of 2010 authorization was received from the Office of Statewide Health Planning and Development (OSHPD) for Health Workforce Pilot Project # 172. The HWPP duties were added to the VDH patient care system in January of 2011. The allied dental personnel in the project have completed the following types of procedures:

- Collection of patient information (including medical and dental history, consent forms, risk assessment)
- Charting of pre-existing conditions
- Digital radiographs
- Digital intra and extra-oral photographs
- Prophylaxis
- Periodontal scaling and root planning as allowed by their license
- Fluoride varnish
- Sealants
- Interim Therapeutic Restorations
- Patient, parent, staff oral health education
- Nutritional counseling
- Oral hygiene instructions
- Case management
- Referrals
- Communication with collaborating dentist

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*Just being able to be seen is a positive asset. As a school nurse who has been working in the district boundaries for over 20 years, I have seen the struggles families must overcome to get their child in for dental care.*

*–VDH Site Administrator*

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14 California Office of Statewide Planning and Development. Health Workforce Pilot Project Program. <http://www.oshpd.ca.gov/hwdd/HWPP.html>.

15 California Office of Statewide Planning and Development. Health Workforce Pilot Project Application #172. [http://www.oshpd.ca.gov/hwdd/pdfs/HWPP/Abstract\\_HMPP172.pdf](http://www.oshpd.ca.gov/hwdd/pdfs/HWPP/Abstract_HMPP172.pdf).

In addition to the procedures performed by allied dental personnel, as listed above, dentists in the project have performed initial and periodic patient evaluations using the telehealth system, and performed other advanced dental procedures for patients referred to their offices. Table 2 summarizes the number of patients and visits in community sites by the type of community site.

Population Type	# of Patients Seen	Total Visits
Head Start Preschool	2316	4034
Elementary School	546	2189
Long Term Care Facility	189	802
Multifunction Community Center	259	500
Regional Center	132	442
Total	3442	7967

Table 2: Virtual Dental Home Patients and Visits by Type of Site as of 12/31/15.

A benefit of the VDH model of care is that many individuals can receive all the care they need in the community location where the VDH program is located. Procedures that can be performed in the community location are performed there. When individuals need more advanced care, they are referred to dental offices or clinics for those services. Even those individuals who need more advanced treatment in dental offices or clinics can have initial prevention services and early intervention services performed in the community and on-going diagnostic and preventive services performed in the community site. Table 3 lists the percent of individuals participating in the VDH system who were deemed by the reviewing dentist to need care at that time in a dental office or clinic. Approximately two-thirds of children and about half of seniors and people with disabilities in long term care facilities were determined by the examining dentist to be able to be kept health by services performed by allied dental personnel in the community site without the need to see a dentist in-person.

Type of Site	% Needing Referral to Dental Office
Elementary School	33%
Head Start Preschool	32%
Long Term Care Facility	54%

Table 3: Percent of Individuals Deemed by Reviewing Dentist to Need Treatment in a Dental Office or Clinic as of 12/31/15

### Ability to Keep and Verify that People are Healthy in Community Sites

In addition to keeping the majority of people healthy in community sites, the VDH system allows the dentist to verify, using the telehealth system, that those individuals are healthy. In almost all other school or community-based oral health care systems, people receive some types of care in the community and then are all referred to a dentist to perform a complete examination. The fact that the VDH examination is completed in the community means that scarce referral and care navigation resources can be focused on those individuals who need additional care.

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## Health Workforce Pilot Project Procedures

As indicated above the Health Workforce Pilot Project (HWPP) associated with the Virtual Dental Home demonstration project tested two duties not normally part of the scope of practice of allied dental personnel: The ability to decide which radiographs to take to facilitate an oral evaluation by a dentist and the ability to place Interim Therapeutic Restorations. The allied personnel in this project received didactic, laboratory, and directly supervised clinical training in these duties. They were then closely monitored in what is called the “utilization” phase of the project by both the collaborating dentist in their community and an independent dentist evaluator not connected with the care being provided in their community.

Table 4 lists the number of HWPP procedures performed during the HWPP (December 2010 - May 2015). Note that every patient seen in the project had a decision made about which radiographs to take, even if the decision was not to take any radiographs. There have been 7967 visits and therefore 7967 decisions even though there were only 2535 instances where the decision was to take any radiographs. Also note that 120 Interim Therapeutic Restorations were placed during the training phase of the program in addition to the 1019 placed in the utilization phase for a total of 1139. Those placed in the training phase were placed under direct supervision of dentists while those placed in the utilization phase were placed under general supervision of dentists. Under California law, general supervision refers to procedures performed by allied dental personnel based on instructions given by a licensed dentist, but not requiring the physical presence of the dentist during the performance of those procedures.

<b>Population Type</b>	<b># of Patients Seen</b>	<b>X-rays Taken in Utilization</b>	<b>ITRs Placed in Utilization</b>	<b>ITRs placed in Training</b>
Head Start Preschool	2316	1318	443	40
Elementary School	546	739	91	30
Long Term Care Facility	189	138	237	20
Multifunction Community Center	259	244	135	10
Regional Center	132	96	113	20
Total	3442	2535	1019	120

Table 4: HWPP Procedures Performed as of 12/31/15

As described above allied dental personnel participating in this project have been closely monitored in what is called the “utilization” phase of the project by both the collaborating dentist in their community and an independent dentist evaluator not connected with the care being provided in the community setting. A specific set of criteria and a rating rubric is used for rating the decision about which radiographs to take and placement of Interim Therapeutic Restorations. The procedures that meet the criteria were rated as acceptable. Procedures that did not meet the criteria were rated as unacceptable.

In addition to the evaluation of the results of the HWPP duties being tested, there was a system in place to report any adverse outcomes. This would include patients who developed problems as the result of procedures performed by allied dental personnel participating in the project.

As indicated in Table 5, all procedures performed by the allied dental personnel were rated as “acceptable”. No procedures were rated as “unacceptable”. In addition, there were no reports of adverse outcomes reported in this project.

Procedure Performed During Utilization Phase	# Performed	# of Procedures Rated as Acceptable	# of Procedures Rated as Unacceptable	Adverse Outcomes
Radiographic Decision	2535	2353	0	0
Interim Therapeutic Restorations	1019	1019	0	0
All Other Procedures	52966	52966	0	0

Table 5: Ratings of Procedures and Occurrences of Adverse Outcomes as of 12/31/15

These results indicate that allied dental personnel in the Virtual Dental Home demonstration project were able to perform the duties being tested under HWPP #172 safely and effectively.

In addition to successful placement of ITRs with no adverse outcomes, the retention or replacement of ITRs was also tracked in a separate analysis for children in Head Start preschools for ITRs placed by dental hygienists. This population was chosen for analysis because they had the most ITRs placed allowing for an analysis to be performed. The period of 12/1/10 to 7/31/15 was chosen for this analysis because of adequate data availability for that time period. During that period 434 ITRs were placed on 160 children in Head Start for an average of 2.71 ITRs per child. Children who had ITRs placed and were still enrolled in the preschool were recalled during this time period at 3 month intervals. Although the number of teeth able to be followed over time, there was sufficient data to evaluate the retention of the ITRs at 3, 6, and 9 months post-placement.

At 3 month recall visits 82% of the ITRs followed were intact and 4% were replaced by a conventional restoration. At 6 months post-placement, 76% of the ITRs followed were intact and 13% were replaced by a conventional restoration. At 9 months post-placement, 70% of the ITRs followed were intact and 16% were replaced by a conventional restoration. ITRs that were not intact and had not been replaced could be re-evaluated and replaced if warranted. Although this is preliminary data and this study would need to be repeated with larger data sets over longer time periods, it indicates that dental hygienists can place ITRs in community settings with a high degree of retention, at least in the first 9 months.

	3 months	6 months	9 months
ITRs Intact	82%	76%	70%
ITRS replaced by a conventional restorations	4%	13%	16%
Total	86%	89%	86%

Table 6: Retention or Replacement of ITRs in Head Start Pre-schools 12/1/10 to 7/31/15

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## Decisions about Care Location and Referrals

Another analysis of the VDH Demonstration data was performed to assess the success of referrals for those individuals who were deemed by dentists to need a referral to a dental office in addition to preventive procedures performed by allied dental personnel in community sites. This analysis was performed based on data from children using a retrospective chart review. Since the number of data points was small, it should be considered preliminary data and this study would need to be repeated with larger data sets over longer time periods. For those children where it could be determined whether they kept referral appointment(s), the results indicated that 59% of them were found to have kept the referral appointment(s). 83% of those were found to have received the treatment they needed. If repeat and larger studies indicate the same trend this would mean that approximately 83% of children seen in the program had their dental needs met.

## Patient, Caregiver and Administrator Satisfaction

The Virtual Dental Home (VDH) demonstration was designed as a patient-centered model of care that would address obstacles to accessing dental care faced by many underserved and vulnerable people in a manner that was sensitive to and respectful of the needs and desires of patients, caregivers, and administrators. To assess the satisfaction of those groups a series of satisfaction surveys were conducted in 2012 and 2013. As indicated in Table 6, satisfaction with the VDH system among parents of children served was quite high with 94% of all respondents indicating that they were "very satisfied" (86%) or "somewhat satisfied" (8%) with the overall dental care their children received. For those that were less than completely satisfied it was primarily because of the challenges they faced in getting more advanced work completed in dental offices. Perhaps more importantly, satisfaction surveys also revealed that nearly all respondents indicated that they would continue with the program if it continued to be available.

Satisfaction	Number Responding	% of Respondents
Very satisfied	137	86%
Somewhat satisfied	12	8%
Somewhat dissatisfied	4	3%
Very dissatisfied	4	3%
I do not know	3	2%
Total	160	-

Table 6: Patient/Parent Satisfaction with VDH System as of 6/30/13

Satisfaction surveys also assessed the degree to which the VDH model addressed known barriers to receiving oral health services. Table 7 indicates the results of a survey of administrators of organizations and facilities affiliated with the VDH and indicates that they were highly satisfied with the system with 96% of respondents reporting that they were "very satisfied."

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How satisfied are you with the dental care provided through the VDH?		
Satisfaction	Response Count	% of Respondents
Very satisfied	25	96.2%
Somewhat satisfied	1	3.8%
Not very satisfied	0	0.0%
Not at all satisfied	0	0.0%
Don't know	0	0.0%

Table 7: School Administrator Satisfaction with the Virtual Dental Home as of 6/30/13

Additional results reported by school administrators were that students and families faced fewer transportation issues, had lower cost for care, appreciated the flexible appointment scheduling, faced reduced language barriers, and had an easier time getting dental care for young children and individuals with behavior challenges or complex medical problems.

## Health Outcomes

Health outcomes in the VDH demonstration were tracked in two ways. A direct indicator was collection and tracking of what were called “Basic Measures.” An indirect indicator was the percent of patients that dentists determined needed to be seen by a dentist after that particular population had been involved in the VDH demonstration for a number of years.

### Basic Measures

Pacific designed a system for collecting various health indicators that was modeled after the ASTDD Basic Screening Survey (BSS).<sup>16</sup> The data collection tool was called the Basic Measures module. The BSS was modified to produce more granular results in order to better capture improvement in outcomes like untreated decay. For example, children with untreated decay was replaced by a measure of teeth with untreated decay. The results of the Basic Measures system indicated that there was improvement in these measures over time for groups that participated in the VDH demonstration. Since this was not a main focus of the VDH demonstration this analysis should be considered preliminary. A study focusing on these measures would need to be repeated with larger data sets over longer time periods. If repeat and larger studies indicate the same trend, this would mean that the VDH system not only reaches people who don't get care in the traditional dental care system, and applies proven preventive strategies, but also improves the health of the populations being served.

### Need for Treatment by a Dentist

Another preliminary finding, based on a retrospective chart review for children, was that when patients were involved with the VDH system for up to 18 months the percent whom dentists decided needed referral to a dentist to treat advanced disease fell from 33% to 25%. Again, if repeat and larger studies indicate the same trend, this would mean that the VDH system not only

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<sup>16</sup> Association of State & Territorial Dental Directors. ASTDD Basic Screening Surveys. <http://www.astdd.org/basic-screening-survey-tool/>. Accessed February 14, 2016.

reaches people who don't get care in the traditional dental care system, and applies proven preventive strategies, but also improves the health of the populations being served.

### Economic Analysis

The Virtual Dental Home demonstration has been funded through grants and contracts from federal and state government sources and private foundations. An analysis has been conducted to project the economic viability of this model of care if it were supported by the California Dental Medicaid program, Denti-Cal. Denti-Cal was chosen for this analysis because over 90% of the patients seen in the program are enrolled in the California Medicaid program and eligible for Denti-Cal benefits. It should be noted that full Denti-Cal benefits are available for adults living in Intermediate Care Facilities (ICF) and Skilled Nursing Facilities (SNF) and similar benefits are available for adults in the California Regional Center system. A reduced set of benefits is available for other adults. However, the results presented here are for children as the majority of patients seen in the VDH demonstration were children and the best comparison data from the Denti-Cal program is available for children.

### Potential Fee-For-Service Denti-Cal Billing from the VDH System

A calculation was performed of potential billable procedures under the fee-for service California Denti-Cal program by listing the procedures performed by allied dental personnel in the Virtual Dental Home demonstration and applying current Denti-Cal fees to those procedures that are covered under the Denti-Cal program.<sup>17</sup> Table 6 lists the potential average payment for procedures performed for children in the Virtual Dental Home demonstration program and compares those results with Denti-Cal payments for diagnostic and preventive procedures. The Denti-Cal system paid \$123.64 per child per year for diagnostic and preventive procedures and \$83.13 per child per visit for these same procedures. In the Virtual Dental Home model, Denti-Cal would have paid \$109.20 per year or \$49.40 per visit for children in Elementary Schools and \$138.48 per year or \$80.37 per visit for children at Head Start Preschools for these procedures. In the VDH model these visits included ITR procedures in addition to the diagnostic and preventive procedures paid for by Denti-Cal. Therefore, Denti-Cal would have paid less for these prevention and early intervention procedures using the VDH model than Denti-Cal is currently paying in the traditional model of care. In addition, Denti-Cal was paying for an average of 1.61 visits per child for diagnostic procedures and 1.39 preventive procedures per year while the VDH model was providing an average of 1.72 diagnostic and preventive visits per child in Head Start Preschools and 2.21 in elementary schools at a lower average cost per child.

Potential Billing	Elementary Schools			Head Start Preschools			All Children		
	Visits/Yr	\$/yr	\$/Visit	Visits/Yr	\$/yr	\$/Visit	Visits/Yr	\$/yr	\$/Visit
VDH	2.21	\$109.20	\$49.40	1.72	\$138.48	\$80.37	-	-	-
Denti-Cal Payment (2012)	-	-	-	-	-	-	1.61	\$123.64	\$83.13

<sup>17</sup> Denti-Cal's MCS0070 Report Fiscal Year 2012

Table 8: Average Visits and Potential Payment for VDH Program compared with Current Denti-Cal Program Payment for Diagnostic and Preventive Procedures as of 8/30/15.

**Cost of Providing Care in the Virtual Dental Home Model**

The next analysis performed was a calculation of the cost of providing services through the Virtual Dental Home model.

Table 9 contains a projection of costs for providing care in the Virtual Dental Home model in elementary schools and Head Start Preschools based on the experience in the Virtual Dental Home demonstration. The expenses for oral health personnel are listed along with the costs for supplies and amortization of equipment. This data is presented as per visit costs.

Average Cost	Elementary School Visit			Head Start Visit		
	Rate/Hr	hrs/visit	\$/visit	Rate/Hr	hrs/visit	\$/visit
Hygienist	42	0.50	\$21.00	42	0.33	\$13.86
Dental Assistant	15	0.50	\$7.50	15	0.33	\$4.95
Dentist	75	0.13	\$9.38	75	0.13	\$9.38
Supplies			\$3.00			\$2.00
Equipment			\$1.00			\$1.00
Total			\$41.88			\$31.19

Table 7 Average Costs for the Virtual Dental Home Model of Care in Schools and Head Start Preschools as of 8/30/15

The costs of providing care in the VDH model consist of per hour payments to dentists and allied dental personnel as described above plus cost for supplies and amortized costs for equipment. As the VDH project has progressed, the time per visit has decreased. It is estimated that in a production environment the allied dental personnel could see 3 children per hour in a Head Start Preschool, and 2 children per hour in an elementary school. Adding an estimated \$2 per visit for supplies and \$1 per visit for amortized equipment produces a cost per visit of \$31.19 in Head Start Preschools and \$41.88 in elementary schools. This cost would be slightly less than projected billing per visit. It is noteworthy to realize that the VDH system delivers significantly more care than the current Denti-Cal system does in that it includes ITR procedures, patient, parent and caregiver education, integration of oral health awareness and considerations in these social and educational systems, and case management.

**Potential Encounter-based Denti-Cal Billing from the VDH System**

Based on the estimates of numbers of encounters and visits described above, health centers being paid an average encounter rate of \$150 per visit for MediCal covered patients would produce about \$100 in revenue more than their direct costs if all visits were for MediCal covered procedures were paid for all visits. However, even if only half the visits produced billable encounters, the system would still be financially viable.



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## The VDH in the Era of Accountability

As above, the VDH system is financially viable now in the fee-for-service and encounter-based payment systems. The VDH model will have even better economic viability as our oral health care system turns further toward paying for health outcomes since it provides a low cost system for getting preventive and early intervention care to children who do not normally access dental care in the traditional delivery system. Early prevention and early intervention care is likely to reduce the need for much more expensive advanced treatment, emergency department and operating room care and other costs of neglect.

## Policy Changes

The VDH demonstration resulted in significant policy changes in oral health delivery in California. A bill, AB 1174, was passed and signed by the governor in September 2014 that incorporated the two duties Pacific tested in the HWPP into the scope of practice of Registered Dental Hygienists in Alternative Practice (RDHAP), Registered Dental Hygienists (RDH), and Registered Dental Assistant in Extended Functions (RDAEF). It also required California's Medicaid dental program, Denti-Cal, to pay for services performed using "store-and-forward" teledentistry.

Before provisions of the legislation could take place, regulations needed to be adopted by the relevant regulatory agencies. During 2015, The California Dental Hygiene Committee (DHCC), and the Denti-Cal branch of the California Department of Health Care Services (DHCS) adopted regulations to permit training of dental hygienists in the new duties and payment for procedures performed using "store-and-forward" teledentistry. The Denti-Cal system issued a provider bulletin in October 2015 that provided instructions for billing for teledentistry facilitated services.<sup>18</sup> In addition, the California Primary Care Association has produced a technical assistance guide that includes instructions for billing for encounters performed using the Virtual Dental Home system.<sup>19</sup>

These changes in the regulatory environment have enabled Pacific to move from testing the VDH delivery system to expanding the system and demonstrating the ability of care providers and communities to sustain VDH systems using program revenue.

## **Future work**

With the completion of the VDH demonstration and the adoption of legislation and regulations described above, Pacific intends to continue to expand the VDH system and further study its ability to impact health outcomes and the economics of using this system in various environments. Aspects of the future work include:

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18. California Medi-Cal Dental Program. Denti-Cal Bulletin. October 2015. Volume 31, Number 15. [http://www.denti-cal.ca.gov/provsrvcs/bulletins/Volume\\_31\\_Number\\_15.pdf](http://www.denti-cal.ca.gov/provsrvcs/bulletins/Volume_31_Number_15.pdf).

19. The California Primary Care Association. Increasing Access to Oral Health: A Technical Assistance Guide for California Health Centers. [http://www.cPCA.org/cPCA2013/assets/File/CPCA\\_OralHealth\\_vf-1.pdf](http://www.cPCA.org/cPCA2013/assets/File/CPCA_OralHealth_vf-1.pdf).

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- Help entities in other states replicate the VDH system. There are currently VDH replication projects funded and underway in Colorado, Oregon, and Hawaii. A number of other states have expressed interest or are already planning for VDH replication projects.
  - Expand the use of the VDH system in California. Pacific has replication projects underway in several communities in California and plans to support many more communities in the future.
  - Expand the study of health outcomes, barriers to success, and economic results.

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The VDH is unique expansion of health programs within a school setting and would improve health care services for all types of schools and students. -VDH Site Administrator

## Conclusions

The Virtual Dental Home model is a system of care that has been demonstrated in a multi-site demonstration project across California. Included in the demonstration was a Health Workforce Pilot Project (HWPP) that demonstrated the safety and acceptability of two procedures when performed by allied dental personnel. The Virtual Dental Home system has proven to be a safe and effective method to bring dental care to California’s most vulnerable and underserved populations. It is also a system for providing essential prevention and early intervention services at a low cost per individual.

Among the main findings are:

- The VDH creates a “continuous presence” system of care where allied dental personnel are present in community sites throughout the year, integrating oral health awareness considerations and activities into the structure and processes of community educational, social, and general health systems. This system of continuous presence is critical to educating and supporting children, parents, adults, and caregivers to adopt and support health promoting behaviors and diets which are critical to improving oral health.
- The VDH allows the majority of people seen in community sites to be kept healthy with only allied dental personnel being physically present with them. It also allows these individuals to be verified as healthy by dentists, removing the need for them to travel to a dental office to be verified as healthy.
- The VDH connects dentists in dental practices and clinics to activities in community sites creating “community-clinical” linkages and a full system of care.
- The VDH creates a new vision of a dental practice with the dental office and clinic becoming a part of a larger “practice without walls” that includes the community location.

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## About the Authors

This report was prepared by Paul Glassman, DDS, MA, MBA, Maureen Harrington MPH and Maysa Namakian MPH. Dr. Glassman is a Professor in the Department of Dental Practice at the University of the Pacific Arthur A. Dugoni School of Dentistry and Director of the Pacific Center for Special Care. Ms. Harrington is the Director of Grant Operations and Community Education and Ms. Namakian was formerly a Program Managers at the Pacific Center for Special Care.

For further information contact:

Paul Glassman DDS, MA, MBA  
Professor of Dental Practice  
Director, Pacific Center for Special Care  
University of the Pacific  
Arthur A. Dugoni School of Dentistry  
155 5<sup>th</sup> Street  
San Francisco, CA 94103  
Email: [pglassman@pacific.edu](mailto:pglassman@pacific.edu)  
Web: [www.pacificspecialcare.org](http://www.pacificspecialcare.org)

Maureen Harrington MPH  
Director, Grant Operations  
Pacific Center for Special Care  
University of the Pacific  
Arthur A. Dugoni School of Dentistry  
155 5<sup>th</sup> Street  
San Francisco, CA 94103  
Email: [mharrington@pacific.edu](mailto:mharrington@pacific.edu)  
Web: [www.pacificspecialcare.org](http://www.pacificspecialcare.org)

More information about the Virtual Dental Home demonstration project is also available at:  
<http://www.virtualdentalhome.org>