POLICY BRIEF

THE COSTS OF NEGLECT OF DENTAL DISEASE:
AND THE IMPACT OF THE VIRTUAL DENTAL HOME

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THE COSTS OF NEGLECT OF DENTAL DISEASES

Neglected dental disease can lead to serious, widespread, and sometimes tragic consequences, including missed school days among children and missed work among adults, increased expenses for advanced reparative dental treatment, preventable visits to hospital emergency departments and operating rooms, decreased social engagement and employability among adults with missing teeth, and even occasional life threatening infections.

What’s more, neglected dental disease can actually increase costs for state Medicaid programs and other purchasers of dental benefits as these programs spend money on the consequences of neglect rather than on keeping their beneficiaries healthy. Research suggests, however, that a program focused on children and adults at high-risk of developing dental disease could both save money and improve the oral health of vulnerable and underserved populations. Emphasizing scientifically validated prevention and early intervention procedures can help to increase both clinical and cost effectiveness of such a program.

Indeed, our analysis suggests that if 1000 children enrolled in Head Start who were previously not receiving dental services were to participate in such a program, California’s MediCal program would actually save $2000 because the cost of providing the services would be more than offset by lower costs stemming from the consequences of neglect. This is just one example of the potential benefits of such a research and prevention based program; other populations stand to reap benefits as well.

THE VIRTUAL DENTAL HOME

The Virtual Dental Home is a model of delivering dental care that focuses on high risk children and adults and emphasizes scientifically validated prevention and early interventions procedures; in other words, the Virtual Dental Home is just the kind of research and prevention based program that has the potential to both improve oral health and lower costs for vulnerable populations in California. This model of care has been in operation for the last three years in a California state-wide demonstration system of care operated by the Pacific Center for Special Care at the University of the Pacific Arthur A. Dugoni School of Dentistry. It has created a “virtual dental home” for patients who might not otherwise be able to access care in a traditional dental office. The Virtual Dental Home provides prevention-focused oral health services in community sites such as Head Start Centers, schools, residential living facilities for people with disabilities, and long-term care institutions for dependent or elderly adults. In these community settings, dentists, connected via telehealth technology, evaluate electronic health records and recommend preventive and early intervention restorative treatments.

Filling a Critical Void: Why the Virtual Dental Home is Needed

The traditional office and clinic-based oral health care delivery system is failing to reach a large segment of the population. In 2011, the Institute of Medicine and the National Research Council of the National Academies of Science issued two reports on oral health. Both of these reports describe the significant proportion of the U.S. population that does not access oral health services. In California almost one-quarter of all children have never seen a dentist. Among California black, Latino, and Asian preschoolers, 40 percent have never seen a dentist.1

Among low-income or disabled populations, limited access to dental care can be an even more significant issue. A national analysis in 2010 by the Government Accountability Office indicated that only about one-third of children enrolled in Medicaid received any dental service during the 2008 fiscal year.2 In California, oral health disparities are even more severe. According to a 2011 report from the California HealthCare Foundation, just 25 percent of

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2 United States Government Accountability Office, “Oralhealth: efforts under way to improve children’s access to dental services, but sustained attention needed to address ongoing concerns,” November 2010.
those eligible for Medi-Cal dental services actually received any service; among pregnant women with Medi-Cal coverage, only one in seven received dental services.3

The picture for disabled Californians is equally troubling. Many reports show that people with disabilities have more dental disease, more missing teeth, and more difficulty obtaining dental care relative to other members of the general population.4

Without access to needed preventive dental care, Californians can experience significant personal and economic consequences. Poor oral health can also lead to poor self-esteem, pain and suffering, and missed days from school or work. In fact, in California more than 500,000 children missed school due to a dental problem in 2007.5

Even more important, avoiding needed preventive dental care can result in costly and painful health consequences. In 2007, there were more than 83,000 visits to California hospital emergency departments for preventable dental conditions.6 And, research suggests that for many populations, lack of preventive dental care can lead to increased costs for health care generally.7

The Virtual Dental Home system of care is an effort specifically designed to address the barriers that prevent Californians from receiving needed dental care.

The Fiscal Impact of the Virtual Dental Home system of care

While the primary goal of the system of care is to improve access to dental care through a “virtual dental home,” and, in so doing, improve oral health for its patients, the cost-effectiveness of the program’s interventions is also an important factor. Our analysis suggests that the Virtual Dental Home can provide cost-effective care for many of the state’s MediCal patients.

PREVIOUS RESEARCH ON PREVENTIVE CARE

This policy brief presents a summary of the results of a longer report by the Blue Sky Consulting Group.8 That research was based on the insights gathered from the group of dental experts brought together to help identify the impact and potential cost-effectiveness of preventive dental care. The efforts of this group of scholars and practitioners as well as additional research efforts by the study team produced a compendium of almost 150 published studies, which were closely reviewed and synthesized in order to develop a simulation model that was used to estimate the potential cost savings from the Virtual Dental Home system of care for the MediCal program.

Is Preventive Care Effective?

A large body of published research literature on preventive dental visits and services demonstrates that this proactive care is generally effective in reducing disease and decay and improving oral health, both for children and adults.9,10 In addition, many advocates and practitioners have observed health, educational, social, and societal benefits associated with improved oral health and reduced incidence of decay. These benefits include fewer days missed from school, reduced pain and suffering, and improved self-esteem and employability.11

One recent study of a Washington State program called the Access to Baby and Child Dentistry (ABCD) program which seeks to increase access to preventive dental services (similar to the Virtual Dental Home system of care) found that children in a county with the program had more sound teeth, fewer crowned teeth, and fewer missing primary teeth than did children in a county without the program.1 In another study of the length of time between

6 Emergency department visits for preventable dental conditions in California, California HealthCare Foundation, May 2009.
7 See, for example, George W Taylor et al., “Is Periodontal Treatment Associated with Lower Medical Costs in Adults with Diabetes? Findings in Blue Care Network 2001-2005,” January 2009.
9 Preventive dental care can take many forms, but it generally includes an exam by a dental care professional, as well as teeth cleaning or prophylaxis, and fluoride treatments or application of sealants.
dentist visits in adults, researchers found that patients with longer periods between visits had worse outcomes relative to patients who were seen more frequently. For Medicaid patients in particular, the study found that more frequent visits led to improved oral health outcomes.ii

Studies that evaluated the effectiveness of specific preventive procedures (as opposed to preventive care generally) also demonstrate the effectiveness of preventive dental care. For example, a meta-analysis of seven studies on sealants found that those with sealants had 50 percent fewer caries (tooth decay or cavities) relative to those that had not received sealants.iii Moreover, a review of the literature on sealants conducted by the Centers for Disease Control and Prevention (CDC), led the CDC to recommend the use of sealants in school-based dental care programs.iv Similarly, a meta-analysis of 133 studies on topical fluoride applications, which include fluoride toothpaste, mouth rinses, gels and varnishes, found that topical fluorides have been firmly established as beneficial in preventing decay in children aged 5 to 16 years.v A systematic review of the (relatively scarce) literature on the impact of fluoride on adults found that exposure to any mode of fluoride reduced caries by about 25 percent.vi

Several studies also examined the link between preventive dental care and patient health generally. For example, scaling and root planing, which are used to address periodontal disease, have been increasingly identified as effective mechanisms for helping to control diabetes in adults.vii In addition, scaling and root planing are associated with a decreased risk for future cardiovascular events and decreased risk of chronic obstructive pulmonary disease, although the evidence of improved cardiac health outcomes is not as strong as that found for diabetes.viii

Is Preventive Dental Care Cost-Effective?

Although preventive care generally produces better health outcomes, the monetary benefits of fewer fillings, crowns, extractions, and follow-on health care costs (i.e., cost-effectiveness) is a separate research question.

For young children, research suggests that preventive visits can be cost-saving in the long-run when targeted to high-risk users. However, preventive programs with less targeted approaches can have mixed results. For example, studies have found that un-targeted fluoride varnish programs which treated all young children were more costly than usual care. (There is insufficient evidence to draw conclusions about the cost-effectiveness of fluoride for older, school-aged children). For sealants, which are applied to school-aged children, studies that relied on the actual claims experience of low-income Medicaid populations found that sealing molars without an analysis of individual risk would cost more than it saves in reduced filling expenditures, partly because many children were unlikely to seek treatment for decay and children who would not have developed caries might receive sealants. When sealants were targeted to high-risk children or when decayed teeth were restored instead of ignored, then sealants saved money.12

The cost-effectiveness research for adults is more limited, although research does suggest that preventive care can be cost-effective under some circumstances. Most notably, several studies looked at the impact of preventive dental care on medical costs. For example, an analysis of health insurance claims data found that, for diabetic patients with an average of 1 to 2 preventive procedures in a year, total per member per month (PMPM) health care costs were 11 percent lower relative to those without periodontal and prophylaxis procedures. A similar analysis of Maine's all-insurer database found that patients with cardiovascular disease and one periodontal visit in the year had overall medical costs that were 4 percent lower relative to those without a visit.x

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The Model

Although the published research can shed some light on the potential cost impact of the Virtual Dental Home program, the relative lack of cost-effectiveness studies combined with the conclusion that many procedures are only cost effective if carefully targeted to specific populations suggested that an analysis of California’s specific circumstances and patient populations was needed. The Blue Sky Consulting Group developed a simulation model that utilized published research to establish the clinical effectiveness of various dental care interventions similar to those provided by the Virtual Dental Home, and then applied California-specific costs for the Medi-Cal program to arrive at an overall estimated fiscal impact specific to California. Because the impact of dental care varies by patient risk level, which changes with age and disability status, the fiscal impact model organized the populations served by the system of care into four categories: older adults residing in skilled nursing facilities (SNFs), adults with developmental disabilities living in intermediate care facilities (ICFs) or served by a Department of Developmental Services regional center, children age 6 to 18 that are attending school, and children under 6 that attend Head Start. For each population, the impact of several dental care services similar to those provided by the Virtual Dental Home system of care was modeled. Figure 1 presents a schematic representation of the model developed.

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Figure 1: Model of Preventive Care Cost and Benefits
RESULTS

The preventive care model and potential cost outcomes showed that ongoing and targeted preventive dental care could produce savings for the MediCal program. Specifically, our results suggest that MediCal could save $2 per Head Start patient visit, $0.20 per patient visit in a skilled nursing facility, and $18 per disabled adult visit. In other words, each time a patient receives care from the Virtual Dental Home, the Medi-Cal program stands to experience a fiscal benefit that exceeds the costs of providing the service. In addition, the modeling suggests that preventive services for school-aged children return a substantial portion of Medi-Cal expenditures in future benefits even though they do not produce a short-term overall savings per patient, but instead would result in a net cost of $36 per patient visit. These per patient visit figures can produce significant savings when applied to the many patients seen every year by the Virtual Dental Home system of care.

CONCLUSION

Low-income, elderly, and disabled populations in California can face significant obstacles in seeking to access dental care and have significant dental disease with many consequences. The Virtual Dental Home system of care offers the potential for an innovative, low-cost method to improve dental outcomes for these vulnerable populations. The research summarized in this policy brief suggests that there may be fiscal benefits for the MediCal program as well, at least with respect to young (pre-school aged) children and adults in institutionalized settings. Results of this modeling suggest that for school-age children, the program can produce improvements in future oral health although there is a modest cost to achieve this benefit. In addition to the fiscal impact of the Virtual Dental Home system of care on the MediCal program, there are other real, but less well studied benefits such as reduced days missed from school or work, decreased pain and suffering, and increased socialization, employability and self-esteem.

13 These results are calculated relative to a “usual care” baseline, in which patients do not receive risk-based, targeted preventive care.
ABOUT THE AUTHORS

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This brief includes a summary of a more in depth research report, available at http://www.blueskyconsultinggroup.com/storage/Impact_of_the_Virtual_Dental_Home_Project.pdf. Financial resources to support this system of care were provided by the California Health Care Foundation through a grant to the Pacific Center for Special Care at the University of the Pacific Arthur A. Dugoni School of Dentistry.

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xi DMFS is the acronym for decayed, missing, and filled permanent tooth surfaces, a measurement of decay prevalence.

xii Note that these results are presented on a per visit basis, but assume that patients receive ongoing dental care as part of their participation in the Virtual Dental Home program.