

Creating a Successful School-Based Mobile Dental Program

DAVID M. JACKSON, DDS, MPH^a
LAUREN R. JAHNKE, MPAff^b
LISA KERBER, PhD^c
GENIE NYER, RN, MPAff^d
KAMMI SIEMENS, MSSW^e
CAROL CLARK, JD^f

ABSTRACT

BACKGROUND: Dental disease is one of the leading causes of school absenteeism for children. This article describes the creation and evolution of the St. David's Dental Program, a mobile school-based dental program for children.

METHODS: The dental program is a collaboration of community partners in Central Texas that provides free dental care to low-income children in schools without relying on reimbursements or government funding.

RESULTS: Since 1998, the program has provided 132,791 screenings for oral health treatment needs and 38,634 encounters for sealants or treatment. In 2005, the program provided \$2.1 million worth of services at a cost of \$1.2 million (not including donated services). Factors important to the program's success included sustained funding for general operating costs; well-compensated clinicians to deliver care and experienced human service workers to manage program operations; the devotion of resources to maximize consent form return rates; and the development of strong relationships with school district and individual school staff.

CONCLUSIONS: By removing cost, time, transportation, and bureaucratic barriers, the program was able to reach more children than fixed-site clinics. The program was a merging of private and public health dentistry. This model can be useful to other communities in light of the unmet need for dental care and tighter federal, state, and local government budgets.

Keywords: dental; mobile; children; oral health.

Citation: Jackson DM, Jahnke LR, Kerber L, Nyer G, Siemens K, Clark C. Creating a successful school-based mobile dental program. *J Sch Health*. 2007; 77: 1-6.

^aFormer Clinical Director of St. David's Dental Program, Current President of Mobile Healthcare Strategies, (davej@austin.rr.com), 6208 Lost Horizon Drive, Austin, TX 78759.

^bPresident, (lauren@lrjconsulting.com), LRJ Research & Consulting, 5324 Moon Shadow Drive, Austin, TX 78735.

^cDirector of Research and Evaluation, (lisa@sdchf.org), St. David's Community Health Foundation (SDCHF), 811 Barton Springs Road, Suite 600, Austin, TX 78704.

^dDirector of Public Health, (genie@sdchf.org), St. David's Community Health Foundation, 811 Barton Springs Road, Suite 600, Austin, TX 78704.

^eFormer Director of Operations of St. David's Dental Program, (kammi.siemens@stdavids.com), 1807 Palma Plaza, Austin, TX 78703.

^fGeneral Counsel, (carol@sdchf.org), St. David's Community Health Foundation, 811 Barton Springs Road, Suite 600, Austin, TX 78704.

Address correspondence to: Lisa Kerber, Director of Research and Evaluation, (lisa@sdchf.org), St. David's Community Health Foundation (SDCHF), 811 Barton Springs Road, Suite 600, Austin, TX 78704.

NEED FOR CHILDREN'S DENTAL SERVICES

Dental caries (tooth decay) is the most common chronic disease among children.¹ Children suffering from oral health problems experience serious social and health issues such as chronic pain, problems with eating and speaking, inability to concentrate in school, reduced social and family interaction, and diminished self-image and self-esteem.¹ Dental disease is one of the leading causes of school absenteeism for children, and more than 51 million school hours are lost each year due to dental-related illness.¹ In addition to making it harder for children to learn, absenteeism causes school districts to lose money in the 9 states with attendance-based public school funding.²

Unmet need for dental care is concentrated among certain groups. About 80% of untreated cavities in permanent teeth are found in about 25% of children 5-17 years old, most from low-income families.³ Children in families with incomes below the federal poverty level have twice as many carious lesions (cavities) as higher-income children and are less likely to receive treatment.¹ Children from low-income families are also less likely to receive preventive services such as sealants (plastic coatings applied to molar teeth to prevent decay).³ Though Medicaid programs and most State Children's Health Insurance Programs offer children's dental benefits, barriers to access exist, and many providers do not participate in these programs due to low reimbursements. One study showed that fewer than 20% of Medicaid-covered children received 1 dental visit in 1 year.¹

The federal government's Healthy People 2010 initiative calls for increasing the proportion of children receiving sealants on their molar teeth, increasing the proportion of low-income children and

adolescents receiving preventive dental services, and increasing the number of school-based oral health programs.⁴

HISTORY AND GROWTH OF PROGRAM

The St. David's Dental Program screens, treats, and educates children in 2 counties in Central Texas. The program reaches children in public schools during school hours. Treatment occurs on mobile dental vans (Theo Tooth Mobiles) parked in schools' parking lots. Schools are effective places for identifying and treating children at high risk for dental disease due to the number of children readily available.⁵ The dental program does not receive reimbursements or government funding. Its services are free to clients.

The program began in 1998 as a collaboration between the City of Austin and St. David's Community Health Foundation (SDCHF). Its initial goal was to enhance an existing program that was providing dental sealants to children in Austin's low-income public schools using portable equipment. The City loaned a mobile dental van, and the SDCHF provided funding for dental supplies and van maintenance and hired a dentist and a dental assistant.

The program has grown from a sealant program to one of prevention and treatment (Table 1). From 1998 to 2005, the program more than tripled the number of patient encounters. Since 1998, the program has provided 132,791 screenings for oral health treatment needs and 38,634 encounters for sealants or treatment (Table 2). In 2000, the collaboration acquired its first van, Theo I. This self-contained, fully equipped mobile dental facility made it possible to offer therapeutic services to children in schools. In 2000, the program received the Award for Excellence in Texas School Health from the Texas

Table 1. Changes Over Time, St. David's Dental Program, Austin, TX

	SY	
	1998-1999	2004-2005
Program name	Central Texas Children's Dental Health Collaborative	St. David's Dental Program
Services provided	Sealants	Preventive and acute care and health education
Clinic type	1 mobile sealant clinic	1 mobile sealant clinic, 4 mobile dental units
Clinical staff	1 dentist, 1 dental assistant	2.33 dentists, 3 dental assistants
Clinic sites	1 ISD, 46 schools	3 ISDs, 67 schools, 12 community-based organizations
Program budget	\$100,000	\$1,200,000
Children screened	~15,000	37,383
Patients who received sealants	2500	2800
Patients who received treatment	0	4609
Data management	Hard copies only, paper office	Electronic systems

ISD, independent school district.

Department of Health. In 2002, the program added its second van (Theo II) and associated clinical staff (dentist and dental assistant) and increased the number of children served by 26%. Theo III, a donated van, functioned part-time from 2004 to 2005. A new Theo III is under construction, and funding is committed for Theo IV and Theo V. One van will devote half its time to treating the homeless, leaving 4.5 vans primarily to serve school children. Each new van and associated clinical team, when operating full time, can deliver about 2000 more patient encounters per year.

FUNDING AND PARTNERS

SDCHF, the lead agency for the St. David's Dental Program, offers sustained operational funding for the dental program. Sustained funding for general operating costs, including a paid professional staff, is critical to success because programs that rely on volunteer help or inconsistent funding can flounder after the initial burst of enthusiasm wanes.

The St. David's Dental Program applies to other funding sources for grants to cover vans and equipment. Private foundations in Central Texas including the Michael and Susan Dell Foundation, Topfer Family Foundation, Still Water Foundation, and A Glimmer of Hope Foundation have funded vans, mobile sealant equipment, and oral health education. Other funders include the Dell Corporation Foundation, Austin Community Foundation, Texas Department of State Health Services, and individual donors.

The involvement of many partners has been instrumental in lowering some of the barriers to accessing dental care. The cooperation and trust of school district and school staff are necessary to the success of the program. Teachers, school nurses, and other school staff work with program staff to access children in the schools and encourage families to return consent forms. The City of Austin has supplied a van and dental hygienists and coordinated its

sealant services with the vans' acute-care services. Manos de Cristo Clinic, a private nonprofit safety-net provider, has provided dental and health education. Austin Energy provides free electrical drops to power the vans. The Capital Area Dental Society raises funds for dental education and provides volunteers to the program. Volunteer dentists who serve on the vans can raise community awareness about the need for dental care and are able to reassure the local dental community that the dental program is not competing for paying patients.

Volunteers are also an important source of supplemental help. During school year (SY) 2004-2005, 133 volunteer dentists typically worked one to two 4-hour shifts. In calendar year (CY) 2005, volunteer dentists provided 9% of the program's dental services. To make treatment on the vans more consistent, operations more efficient, and ensure that people without financial resources can receive the treatment they need, the program is changing the way it uses volunteers. Rather than providing services on the vans, volunteer dentists from the community are now providing pro bono services for children and adults who need more intensive dentistry than can be completed on the vans.

POPULATION SERVED

The dental program and its vans target low-income children by traveling to title I schools in 3 school districts in Central Texas. A title I campus is one at which a majority of its students are economically disadvantaged or eligible for the federal free or reduced meal program. Table 3 shows number of children screened, identified as needing treatment, and treated by SY.

Theo vans initially operated only during the SY. In 2003, to maximize resources and increase productivity, the vans began to operate during the summer, treating children and adults at local nonprofit

Table 2. Number of Encounters With School Children, St. David's Dental Program, Austin, TX

	Screenings	Sealants or Treatments
1998-1999	~15,000	2449*
1999-2000	~17,000	3990*
2000-2001	19,060	4690 [†]
2001-2002	21,801	5629
2002-2003	23,961	7110 [†]
2003-2004	30,586	7357
2004-2005	37,383	7409 [†]
Total	132,791	38,634

*Sealants only.

[†]Van added.

Table 3. Children Treated at Schools by the St. David's Dental Program, Austin, TX, 2002-2005

	SY		
	2002-2003	2003-2004	2004-2005
Schools visited	46	51	67
Number of students in schools visited	27,650	35,701	45,945
Number of students screened	23,961	30,586	37,383
Number of students identified as needing dental services (consent forms sent home with these students)	14,055	14,040	16,040
Signed consent forms returned	9339	8711	9009
Number of students who received sealants or treatment	7110	7357	7409

agencies and safety-net health care clinics. Service delivery by appointment at these agencies is less efficient than having ready access to a school's population.

Currently, 90% of dental patients are children from low-income families who display decay, gingivitis, pain, or other acute symptoms at their school. About 10% of the patients are children, adults, and seniors referred through health and social service agencies during summer months (Table 4).

SERVICE DELIVERY

The actual delivery of dental services proceeds through the following five steps:

1. Program staff maps out a master screening and site sequence for the SY.
2. At each school, program staff meets with teachers and school administrators to explain the program, its importance, the role of teachers and administrators, and data on past performance specific to the individual campus. Staff also instructs teachers to give students "opt-out" forms to be signed by parents who do not want their children screened. In the current SY, 2005-2006, about 2% of students are opting out of screening.
3. On screening day, a dentist screens all students who did not opt out of screening to determine their dental needs. The dentist gives each student 1 of 4 language-appropriate forms that explains the screening results and requests consent if the child needs sealants or treatment.
 - Child does not need immediate dental work and is reminded to see a dentist regularly (pink form).
 - Child needs dental work that cannot be performed on a Tooth Mobile (yellow form).
 - Child has no visible cavities but would benefit from receiving sealants through program (blue consent form).

- Child needs therapeutic dental work that can be done on a Tooth Mobile (white consent form).
4. Operations staff provides site-tailored reminders and incentives to encourage families to return consent forms, collects signed forms from school, and processes them.
 5. Three weeks after screening, a van goes to the school, and clinic begins for those students who returned consent forms. Throughout the process, program staff strives for minimal disruption of the school's educational environment. Portable sealant clinics are set up inside the school to deliver dental sealants to children. At the same time, children who need therapeutic dental care go in groups from their classrooms to a Tooth Mobile on the school campus. Donated electricity powers the vans, so generators are rarely used, saving money and lowering the noise level. The dentists move from child to child unencumbered by a fixed schedule.

The number of patients treated in the clinic varies. In CY 2005, the average number of people treated per day per dentist was 8. In SY 2004-2005, the average number of elementary and middle school children treated per day per dentist was 10. More comprehensive treatment takes more time with fewer patients being treated, and less comprehensive care allows more patients to receive services. Treating low-income adults and older teenagers also takes more time and resources than treating younger children from low-income families. During summer break 2004, the dental program served 842 people, mostly children, in community-based organizations. In summer 2005, the program served 628 people, mostly adults, in community-based organizations. Other factors influencing the number of patients treated include van maintenance and mechanical problems, equipment failure, staff development, early closure for staff meetings, staff absences, and variations in production among dentists. Optimally, when the clinical team is operating only at elementary schools for a full 6.5 hours (excluding 30 minutes to open the clinic, 30 minutes to close clinic, and 30 minutes for lunch), the program can expect to treat 13 patients per day per dentist.

To maximize the program's resources and patients' comfort and care, the program prioritizes treating decay in permanent teeth, relieving pain, and resolving infection. Preventive care and instructions for home care are also important. As a mobile "safety-net" provider, the program does not serve as a "dental home" for patients. Dentists on the vans do not treat highly decayed teeth needing complicated care or give pain medications other than local anesthesia. The program is not equipped to build or supply prosthetic devices such as crowns, bridges, or

Table 4. Age Group and Race/Ethnicity of Acute-Care Patients, St. David's Dental Program, Austin, TX, 1998-2006

Age group (%)	
Elementary school aged	80
Middle school aged	8
High school aged	4
Adults to age 54	7
Adults 55 years and older	1
Race/ethnicity (%)	
Hispanic	88
White	7
African American	3
Asian	1
Other	1

dentures. Providing these resource-intensive treatments to a few patients would prevent many others from being treated at all.

COST AND VALUE OF SERVICES

In CY 2005, the cost of the program, excluding services donated in kind, was \$1.2 million. Average cost per patient was about approximately \$114. The value of services rendered was \$2.1 million. Average value per encounter was about \$183, and average value of services per patient was about \$337.

PROGRAM STAFF

An operations team and a clinical team make up the dental program. The operations team includes 8 positions. Director of Operations manages all staff and all program activities except individual clinical treatment decisions. The Clinical Director, a dentist who reports to the Director of Operations, develops clinical policy and is responsible for quality assurance. The Information Resource Manager analyzes and reports on program data, develops and maintains the information/technology (IT) system, and acts as IT liaison to partners and vendors. The Site Coordinator promotes the program, ensures that schools are prepared to host the program, and identifies and trains allies at each school who assist the program in boosting consent form return rates. A Consent Form Coordinator promotes the program in English and Spanish, picks up batches of signed consent forms from schools, and enters data into the patient record before each school's clinic. The Consent Form Coordinator also assists the sealant clinic in the schools. The Oral Health Educator, a bilingual social worker, provides oral health education to children and adults. A Volunteer Coordinator, who works three-fourths time, maintains relationships with private dentists in the community, manages the pro bono dentist referral system, and arranges referrals to dentists. The Van Assistant spends two thirds of her time escorting children to and from the vans, interacting with school staff, sterilizing and placing instruments for dental professionals, and entering patient treatment data on the vans. She spends one third of her time translating forms in English and Spanish and scheduling after-school appointments for children and adults.

The clinical staff devote their time solely to dentistry. Full-time, well-compensated dentists who want a career in public health are the key to sustainability and high productivity. Currently, the program employs 2 full-time dentists and 1 dentist who works one-third time. Three dental assistants work with the dentists. Two part-time dental hygienists, donated

in kind by the City of Austin, deliver sealants inside the schools, while the van clinics function outside the school buildings.

MEASURING OUTCOMES

The program is in the early stages of designing a longitudinal study to estimate the impact of the program's services on individuals and the community over time. Currently, Open Dental practice management software provides a centralized database for patient records and performance measurement. Dental assistants can call up patient records and record procedures. The program's current metrics measure productivity and efficiency and account for many factors that influence the number of patients treated:

1. fair market value of services provided per patient encounter and by clinic date (based on 80th percentile of the National Dental Advisory Service Comprehensive Fee Report),
2. actual program costs,
3. number and types of dental procedures performed,
4. number of children who received sealants,
5. number of children treated per day per dentist,
6. number of operational van days per year,
7. number and percentage of consent forms returned, and
8. number of volunteers and services provided by volunteers.

Qualitative measures include level of awareness and positive image in the community and among community dentists and quality of relationships with schools and agencies.

OVERCOMING SPECIFIC CHALLENGES

Higher consent form return rates mean more children can be treated. Consent form return rates are much higher when teachers and other school staff understand the program, choose to emphasize it to students and parents, and encourage the return of consent forms. Recently, program staff began to strengthen promotional activities and an incentive program that motivates teachers and students to return consent forms. Currently, 2.5 full-time equivalents develop and maintain relationships with school personnel and parents and offer incentives such as gift certificates to local businesses for teachers and children. In 2004-2005, the percentage of consent forms returned was 54%. It jumped to 75% in 2005-2006.

The program originally assigned clinic days to schools based on the number of signed consent forms received from each campus the previous year,

with the intent to visit all partner schools in a single academic year. This rigid schedule of clinic dates prevented the clinical team from treating every child with a signed consent form, and children with identified needs went without care. In fall 2005, the program implemented a more flexible schedule in which dental vans remain on campus until all eligible children receive treatment. This positive change does lengthen the number of months required to visit the schools and requires greater communication and flexibility between program and school staff because the clinic schedule can change with little notice.

Some children have dental needs that cannot be addressed on a van, and few providers in the community offer comprehensive care at low or no cost. The program is currently developing a referral system and building a network of private dentists willing to provide free services in their offices to at least 2 patients per year.

Keeping the vans and dental equipment properly maintained is challenging. The vans move frequently, and each move jostles the equipment. The equipment on the vans is also more frequently used than the equipment in many private dentists' offices. The program is attempting to better maintain the vans and equipment with frequently scheduled preventive maintenance days.

An unmet need for dental care remains in Central Texas. In the next few years, the program expects to expand services to all title I schools in the 10-county area surrounding Austin and continue to serve children and adults at nonprofit organizations and clinics during school holidays and summer breaks. The program will treat more children with more comprehensive care as resources become available. The long-term goal is to provide dental treatment for all children in title I public schools.

CONCLUSIONS

The St. David's Dental Program, a collaboration of nonprofit and public agencies, delivers dental

screenings, sealants, treatment, and education to children in Central Texas through fully equipped mobile vans and portable dental facilities that travel to schools. The school setting is an optimal platform for service delivery because the "captive" audience is made up of many children who have little or no access to dental care. Because the program provides free services in schools, it removes most barriers to oral health care including parents' inflexible work schedules, lack of transportation, eligibility, and bureaucratic processes, and cost. Through the dental program, children achieve better health, and schools benefit from healthier children who are more ready to learn.

In 2005, the program provided \$2.1 million worth of services at a cost of \$1.2 million (not including donated services). Factors important to the program's success include sustained funding for general operating costs, well-compensated clinicians to deliver care and experienced human service workers to manage program operations, the devotion of resources to maximize consent form return rates, and the development of strong relationships with school district and individual school staff.

REFERENCES

1. US Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, Md; 2000. Available at: <http://www.surgeongeneral.gov/library/oralhealth/>. Accessed June 3, 2005.
2. Action for Healthy Kids. The learning connection: the value of improving nutrition and physical activity in our schools; 2004. Available at: http://www.actionforhealthykids.org/pdf/LC_Color_120204_final.pdf. Accessed August 15, 2005.
3. US General Accounting Office. Oral health: dental disease is a chronic problem among low-income populations. GAO/HEHS-00-72. Washington, DC; 2000. Available at: <http://www.gao.gov/new.items/he00072.pdf>. Accessed August 18, 2005.
4. US Department of Health and Human Services. Healthy People 2010, oral health, goal 21 (objectives 21-8, 21-12, 21-13). Available at: <http://www.healthypeople.gov/document/html/volume2/21oral.htm>. Accessed August 14, 2005.
5. Grantmakers in Health. Filling the gap: strategies for improving oral health. Issue Brief No. 10; 2001. Available at: http://www.gih.org/usr_doc/oralhealthid.pdf. Accessed August 14, 2005.