



Action for Children and Teenagers in Oral Health Need (ACTION): A self-sustaining student volunteer model of pediatric dental care in an underserved community

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Abstract

Action for Children and Teenagers in Oral Health Need (ACTION) is a sustainable pediatric dental care model in a community health center setting, which generates a net operating surplus by utilizing a hybrid workforce model of dental students, supervising dentists and faculty, and clinic staff. In the last 10 years, ACTION has been financially viable and expanded pediatric dental care provision for an urban under-served community with evidence-based preventive and comprehensive dental care.

Community demographics: The NEED

Dental caries remains one of the most prevalent yet preventable diseases among pediatric populations that disproportionately affects children from low-income households.¹ Dental caries also disproportionately affects children from racial/ethnic minorities, and recent immigrant status alone can increase the risk.^{1,2}

In Massachusetts, 47 percent of children enrolled in MassHealth (Massachusetts Medicaid) did not see a dentist in 2014 but visited the emergency department for tooth-related symptoms at a rate nearly 6 times higher than commercially-insured children (3.4 per 1,000 vs 0.6 per 1,000).³ This disparity in oral health and oral health care is rooted in various factors, including a shortage of dental workforce who is willing to provide necessary dental care to children with public insurance, such as Medicaid. Inadequate reimbursement, administrative requirement, high no-show rate, and poor compliance among Medicaid patients are some of the most common reasons that lead to the low participation in Medicaid among dentists nationally.⁴

Windsor Street Dental Clinic (WSDC) is a community-based satellite dental clinic of the Cambridge Health Alliance (CHA), one of the largest public health hospitals and safety net health system in Massachusetts. CHA serves more than 400,000 residents of the community's most vulnerable and ethnically diverse populations.⁵ In fact, one out of three residents (32 %) in this region speak a language other than English at home.⁶

In 2008, WSDC put a hold on its general dentistry residency program as well as its pediatric dental program due to financial and operational constraints during the recession. A major factor in this operational decision was the elimination of adult dental benefits from MassHealth. Although pediatric dental benefits continued, these changes had a negative impact on pediatric dental access as well. In response to this need, Action for Children and Teenagers in Oral Health Need (ACTION) was created in 2009 by a group of pre-doctoral students at the Harvard School of Dental Medicine (HSDM) and dentists at WSDC.

Student-Initiated Pediatric Dental Clinic: The ACTION

Two pre-doctoral students and a pediatric dental faculty at WSDC examined the possibility of dedicating one Saturday a month to a student-led dental clinic. By identifying that WSDC and CHA had an academic affiliation with HSDM, the founders of ACTION consulted with various key stakeholders to prepare for the launch of a student-led free pediatric dental clinic. The key stakeholders include dental student volunteers, attending faculty, and the facility staff. There was a strong interest from HSDM pre-doctoral dental students to serve pediatric patients in the community. In 2017, the average participation of Class 2018, 2019, and 2020 was 70.3% (N=71) and more than 1500 student volunteer hours were given to WSDC. Due to the relatively lower time commitment, HSDM and CHA affiliated pediatric dental faculty were also available with compensation to teach and guide students for one Saturday per month. The faculty provided direct supervision to pre-doctoral students who delivered dental service to pediatric patients. Availability of WSDC's facility and administrative staff on Saturdays allowed the ACTION program to utilize the existing facility and staff with minimal start-up cost. Since 2009, ACTION has operated its clinic one Saturday a month from 9:30 A.M. to 1:30 P.M. For each ACTION clinic session, WSDC and CHA provide the facility, attending dentist, business and clinical staff, and dental materials and equipment.

ACTION clinic: The Structure and Services

In each ACTION session, 14 HSDM pre-doctoral student volunteers are paired up by student ACTION coordinators. Student volunteers from the first and second-year classes in HSDM perform oral health education in the waiting area and assist student volunteers from the third and fourth-year classes who provide comprehensive pediatric dental services under supervision of the attending dentist. The student coordinators play essential roles in the clinical, operational, and administrative aspects of the program to ensure the success of each clinic session. The head coordinators are in charge of patient management including scheduling, reminder calls, and referrals. Other class coordinators take roles in managing clinic operational flow during sessions.

Dental Services	DIAGNOSTICS		PREVENTIVE TREATMENT				RESTORATIVE TREATMENT			Total number of Services	Total number of Diagnostic and Preventive Services (%)	Total number of Preventive Services (%)
	Dental Exam	Radiography	Prophylaxis	Topical Fluoride Varnish	Oral Hygiene Instruction, Nutrition Counseling	Sealant	Restoration	Indirect Pulp Cap, Pulpotomy	Extraction			
CDT Codes	D0120, D0140, D0150	D02XX	D1120, D1110	D12xx	D1330, D1310	D1351	D23XX, D21XX, D29XX	D3120, D3220	D7111			
2013	145	68	119	124	5	150	65	0	13	689	611 (89%)	398 (58%)
2014	153	103	135	132	12	140	77	6	17	775	675 (87%)	419 (54%)
2015	132	106	137	112	7	166	73	3	7	743	660 (89%)	422 (57%)
2016	152	76	163	14	27	154	50	0	16	793	727 (92%)	499 (63%)
2017 (Jan-Aug)	107	69	113	112	11	100	67	6	6	591	512 (87%)	336 (57%)
Total	698	422	667	627	62	710	332	15	59	3583	3177 (89%)	2066 (58%)

Table 1. Dental Services Provided through ACTION clinic, 2013-2017.
Note: In 2012, an electronic dental record system, Dentrix, was implemented at WSDC, and dental services data provided by ACTION program from January 2013 to August 2017 was analyzed through Dentrix system.

Each pre-doctoral class has two to four ACTION coordinators who are recruited and trained by the head coordinators in the senior class. This practice model provides interested students with the opportunity to learn about dental practice management and community health in addition to clinical pediatric dentistry.

Upon arrival, patients are checked in by WSDC staff and greeted by pre-dental student volunteers who provide patient education and entertainment in the waiting area. Through partnerships with three local universities (Simmons, Wellesley, and Northeastern Universities) and their pre-dental students, ACTION facilitates patient education about oral health and nutrition in the waiting area for patients and their caregivers. ACTION has placed a strong emphasis on disease management and prevention. All patients are evaluated for caries risk and provided a comprehensive treatment plans at their first visit. With close supervision from WSDC and HSDM dental faculty, ACTION student volunteers deliver comprehensive dental treatment for pediatric patients. These evidence-based interventions include sealants and topical fluoride varnish,^{7,8} silver diamine fluoride application, and definitive care, including resin restorations, stainless steel crowns, pulpotomies, and extractions. At subsequent recall appointments, students re-evaluate caries risk and set goals for patients to improve their oral health status.

ACTION clinic: The Outcomes

ACTION volunteers have treated an average of 22 children at each session with a total of 2,066 clinical encounters as of August 2017. Between 2013 and 2017, a total of 413 patients received dental services through ACTION, and 30% of patients (124 individuals) received sealants, exceeding the target rates set by Healthy People 2020 for any age bracket.⁹ Topical fluoride varnish was applied for 92% of total patients (381 individuals). Preventive (58%) and diagnostic (31%) services consisted of 89% of all services provided (Table 1).

Each pediatric patient received an average of \$242 in services, which amounted to \$128 per claim at the MassHealth reimbursement rate of 54% of the usual and customary fee. At each session, insurance and patient payment for the services was about \$2,835 on average with an operational cost of \$750. The staffing cost for ACTION included one receptionist, one dental assistant, and one attending dentist. Excluding facilities costs, the net operating surplus to WSDC was about \$2,185 per session or \$99 per patient. Any positive contribution margin generated by the ACTION program added to the total net surplus for the clinic operations, since WSDC did not provide services on Saturdays prior to ACTION (Table 2). Utilizing existing facilities on a non-working day and maximizing existing partnerships, ACTION was launched with zero start-up cost and created a financially sustainable operational model which does not depend on external funding.

\$2,835	Insurance/Patient payments
-\$600	Staffing costs
-\$150	Supplies
\$2,185	Net benefit to CHA
22	<u>Average number of patients per Saturday session</u>
\$99.32	Contribution Margin per patient

Table 2. Approximate net benefit per patient at ACTION Clinic

Since 2009, student coordinators have identified potential funding and partnership opportunities to ultimately improve clinical care and promote oral health at WSDC and the community. ACTION has received more than \$20,000 in local and national grants, including the Massachusetts Dental Society Ambassador Grant, Harvard Public Service Grant, and Jimmy Carter Academic-Service Entrepreneur Award. With this additional funding as well as net surplus generated by insurance reimbursements and patient payment, ACTION purchased dental equipment, intraoral cameras, iPads, and other oral health education materials. Additionally, ACTION was also able to offer silver diamine fluoride, an alternative treatment option to arrest caries in young children.

Public Health Significance: The IMPACT

The collaboration in this program is precisely designed to benefit all stakeholders and, most importantly, to address public health needs in the pediatric population. First, the patients have benefited by having access to dental care that accepts MassHealth on a Saturday morning, reducing the need to miss school or work for clinic visits. Second, ACTION’s hybrid model of clinic staff and volunteer student workforce generates a net operating surplus to WSDC, while advancing the organizational mission to serve the community. Lastly, this hands-on clinical and administrative experience with active leadership roles allows student volunteers to refine management skills that cannot be developed through standard school-setting and to continue their contribution to underserved communities.

We performed a focused interview among current student ACTION coordinators and found two primary success factors: (1) a high level of autonomy to student volunteers, including policy decisions, training, and budget planning, and (2) maintaining sufficient faculty oversight. ACTION coordinators reported that they also learned about the business aspect of community clinic, as it should have a financially sustainable model maximizing current policy and resources. By accepting Medicaid patients and maximizing the existing resources of a community health center and student volunteers, ACTION could provide affordable pediatric dental care to the pediatric population in the community. With this meaningful experience, ACTION coordinators

have presented the clinic model at various conferences, including the Society of Student Run Free Clinics.

The success of the ACTION program is a demonstration that collaboration between community health centers and student workforce can help sustain a community health center in financial difficulty, while enhancing dental students' clinical experience and leadership skills.

References

1. Institute of Medicine. *Advancing Oral Health in America*. Washington, D.C: National Academy Press; 2011.
2. American Academy of Pediatric Dentistry. *Guideline on Caries-risk Assessment and Management for Infants, Children, and Adolescents*. 2016;37(6):132-139.
3. Massachusetts Health Policy Commission Brief. *Oral health care access and emergency department utilization for avoidable oral health conditions in Massachusetts*. Mass.gov website. <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/publications/oral-health-policy-brief.pdf> Accessed September 10, 2017.
4. California HealthCare Foundation. *Increasing Access to Dental Care in Medicaid: Does Raising Provider Rates Work? Issue Brief, March 2008*. <https://www.chcf.org/wp-content/uploads/2017/12/PDF-IncreasingAccessToDentalCareInMedicaidIB.pdf> Accessed October 26, 2018.
5. Middlesex County 2010 Official Count and Latest Estimates. Secretary of the Commonwealth of Massachusetts. <http://www.sec.state.ma.us/census2020/middlesex.htm> Accessed October 30, 2018.
6. Cambridge Health Alliance. *Culturally Competent Care*. 2014. <https://www.challiance.org/about/culturally-competent-care> Accessed October 29, 2018.
7. Wright JT, Crall JJ, Fontana M, et al. Evidence-based clinical practice guideline for the use of pit-and-fissure sealants. *J Am Dent Association*. 2016;147(8):672-682.
8. *Final Evidence Summary: Dental Caries in Children from Birth Through Age 5 Years: Screening. U.S. Preventive Services Task Force. 2013*. <https://www.uspreventiveservicestaskforce.org/Page/Document/final-evidence-summary2/dental-caries-in-children-from-birth-through-age-5-years-screening> Accessed October 29, 2018.
9. *Healthy People 2020 Topics & Objectives: Oral Health* https://www.healthypeople.gov/node/5001/data_details Accessed September 22, 2017.