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ARTICLE *in* JOURNAL OF SCHOOL HEALTH · JUNE 2005

Impact Factor: 1.43 · DOI: 10.1111/j.1746-1561.2005.00016.x · Source: PubMed

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Models for Delivering School-Based Dental Care

David A. Albert, Joseph M. McManus, Dennis A. Mitchell

ABSTRACT: School-based health centers (SBHCs) often are located in high-need schools and communities. Dental service is frequently an addition to existing comprehensive services, functioning in a variety of models, configurations, and locations. SBHCs are indicated when parents have limited financial resources or inadequate health insurance, limiting options for primary care and preventive services, or within low-access areas such as dental health professional shortage areas. Poor health and concomitantly poor oral health can lead to attendance problems. Oral health services in school-based setting are often the only access to services a child may have. Children who attend schools with SBHCs have immediate access to services that are coordinated with the student's family and school personnel or administrators. Comprehensive services can be collaborative, with support or administration provided by more than 1 organization. For example, the Children's Aid Society (CAS), Columbia University School of Dental and Oral Surgery (CUSDOS), and Columbia University Mailman School of Public Health developed, implemented, and currently operate SBHCs in 2 communities in the northern Manhattan section of New York City (Central Harlem and Washington-Heights/Inwood). The clinics operate in or are affiliated with public schools in New York City. All CAS and Columbia University sites include dental components, using a variety of delivery models. Determining which dental delivery system to use for a particular community or population is a complex decision. The models, reasons for selection, and sustainability of each system are described. (*J Sch Health*. 2005;75(5):157-161)

The first school-based health center (SBHC) was created in Dallas, Tex, in 1970. In the mid-1990s, 600 SBHCs were operating in the United States. A 50% increase has occurred in school-based health care in the United States since the mid-1990s. Today, approximately 1,000 SBHCs are functioning in 42 states, predominantly in urban areas (60%).¹⁻³ Comprehensive SBHCs were authorized in New York in 1978 and are present in high-need schools and communities providing core services for primary care. The services include diagnosis and treatment of medical conditions, basic laboratory, mental health referral, and expanded services defined as health education/prevention, social services, dental care, nutrition, specialty care.

In 2001, 161 SBHCs, sponsored by 55 different organizations, were functioning in New York.⁴ Approximately 11% of SBHCs function in primary schools and 47% function in intermediate, middle, or high schools. Forty-two percent provide care to students in all grades or more than 1 grade. Sponsorship of school-based health is diverse and can include public and private institutions. In 1997, local health departments were responsible for 29% of programs, hospitals and medical centers (27%), community health centers (17%), and community-based organizations and private not-for-profit social service agencies (27%).¹

Prior to instituting a school-based program, it is essential to thoroughly review and examine a community's oral health care needs and its oral health care infrastructure, including dental services available to the target population. Schools offer a well-established infrastructure to support delivery of dental services, but several factors must be considered before creating a school-based model of care. Factors include support and assistance from school and community groups including the parents' association, local community and school boards, and community-based organizations. Parent or community member opposition is detrimental to the establishment and functioning of a viable school-based model. Adequate facilities and space are

critical factors related to sustaining the service. Inadequate or insufficient space may reduce productivity and create an inability to target and meet the needs of the children in the school and surrounding community.

School-based health programs include fixed sites and mobile vans, in which screening, sealant, and fluoride rinse programs are conducted. Many school-based models use a preventive theme. However, in some circumstances restorative or comprehensive care is indicated and provided. School-based dental sealant programs have been effective in increasing the prevalence of dental sealants.^{5,6}

SCHOOL-BASED DENTAL PARADIGMS

Comprehensive, school-based dental health programs provide care in the medically and dentally underserved communities of Central Harlem and Washington-Heights/Inwood in northern Manhattan (New York City). The communities are designated as dental and medical manpower shortage areas. The Columbia University School of Dental and Oral Surgery (CUSDOS) is in the Washington-Heights community on the campus of the Columbia University Medical Center. School-based dental health services are a planned response to improve access to services. Programs were planned and initiated by the Children's Aid Society (CAS) and CUSDOS. Both organizations maintain and operate the centers, which are on fixed sites and open all 12 months. The centers are operated by CAS and/or CUSDOS at locations in public schools or affiliated with public schools. An alternative model uses a dental van owned and staffed by CAS and CUSDOS to visit schools without comprehensive school-based health services. The CUSDOS and CAS centers use portable equipment in some instances. All permanent sites now use fixed equipment only. Portable or carried equipment used in temporary locations⁷ are not components of the fixed-site paradigms described for northern Manhattan. The size of the population (more than 200,000 children) present in a small geographic isolated area, with a significant dental disease burden,^{8,9} and poor access to services weighed against rotating equipment and personnel among sites. The SBHC often is the primary or sole location for general and oral health care delivery. In 1 study, 93% of a clinic's enrollees reported no other source of medical care.⁶

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Dental services provided vary by type of delivery system. Several models have been promulgated in northern Manhattan including comprehensive community dentistry (CCD), preventive/primary restorative (PPR), collaborative (social service agency/university [C]), office centered (OC), preventive (P), and screening (S) (Table 1). Use of one or several of the models in a specific school-based setting is determined primarily by assessing the oral health care needs of the children in the school. The model often is tempered by availability of space, type of space, access to utilities, school hours, and financial support.

DELIVERY MODELS

One-Chair Services

One-chair screening and preventive services are recommended when referrals can be made to a hospital clinic or dental school, an affiliated community health center, or a municipal clinic. Screening and preventive services can be provided with portable equipment at the school or with portable equipment via outreach from CCD, PPR, OC, or C models. Fixed equipment should be used in permanent SBHC sites because (1) it is more ergonomic than portable equipment, resulting in reduced fatigue by clinicians and support staff, thereby increasing the productivity of the model and (2) it is more reliable and less prone to mechanical breakdown. Outreach can be provided to adjoining school sites, community-based organizations, and to Head Start and day care centers. Screenings also can be provided at nearby community health centers without oral health components, with subsequent referral to a CCD during school or after school hours or to an affiliated community dental clinic.

In communities with poor access to dental services, it is essential that preventive and screening services have referral systems to ensure appropriate follow-up and comprehensive care. Access to care in northern Manhattan is limited, particularly for children. Establishing networks for care is essential when a preventive and screening system is employed. Identifying children with dental

disease and providing information to parents without a concomitant system for referral and care restricts the ability of the school-based system to improve the oral health of the children targeted at the SBHC. Establishment of a coherent integrated oral health system is designated as the "anchor concept."

Anchor Concept

The anchor concept ensures that the centers provide comprehensive, rather than piecemeal, oral health care to children. The 2-chair SBHC CCD model operates in a fashion similar to a freestanding dental office and therefore can serve as the anchor in neighborhoods and communities without a community health center, dental clinic, or dental providers willing to accept referrals of children. In the northern Manhattan model, CUSDOS and CAS sponsor freestanding dental clinics that operate in close proximity to the SBHC sites. These clinics, the dental school facility, and the CCD models serve as anchors for the SBHCs. The anchor practices communicate with SBHC administrators to maintain a viable system. Personnel (dental assistants, hygienists, and dentists), at schools and anchor practices, have cross-appointments and responsibilities that provide for coverage, referrals, and improved access to care by providers and staff familiar with school and community clinics.

Preventive/Primary Restorative

The PPR model, situated in schools with limited space, is a 1-chair model that uses dentists to meet the restorative needs of the children enrolled. The dental operatory consists of fixed or permanently stationed equipment, including an intraoral x-ray. Facilities for sterilization of instruments are also present. Support systems can be present on-site for patient scheduling, data entry, and Medicaid billing or supplemented by the sponsoring group at an off-site location. Adequate space for charts and supplies is essential in the PPR model. Links with anchors at affiliated community health centers are necessary to provide referral services for procedures not conducted in the school setting.

C Approaches

The C approach by CAS and CUSDOS has brought additional resources into play by using 2 organizations, in this case, a university (CUSDOS) and a social service agency (CAS) to respond to the patient population needs. The collaboration provides access to specialty referrals and spreads the financial risk and burden incurred from school-based health care services. The C model, in place at Public School 8 elementary school in Washington-Heights, uses a PPR 1-chair model with staff operations provided by CUSDOS and CAS. The C model requires increased time and administrative interaction between organizations; however, it has provided consistently higher productivity and improved treatment outcomes compared to sites using a PPR paradigm without collaboration.

OC Models

The OC model creates a school-based clinic in a community agency. Students from neighboring schools are escorted to the clinic for services. CAS operates an OC

Table 1
School-Based Paradigms and Personnel

Paradigms for school-based dental care

1. Comprehensive community dentistry
2. Preventive/primary restorative
3. Collaborative (social service agency and academic medical center/university)
4. Office centered
5. Preventive
6. Screening

Staff required in the school-based models

- Dentist(s)—1,2,3,4,5,6
- Dental hygienist(s)—1,2,3,4,5,6
- Dental assistants(s)—1,2,3,4,5,6
- Patient escort—1,3,4
- Advanced education in general dentistry Fellows—1,3
- Dental student(s)—1

model at the Dunlevy-Milbank Health and Community Center. SBHC personnel escort children from Public School 207 to the CAS facility. The Dunlevy-Milbank Center provides access to care for children from the public school and for community children who use the full-service center. The OC model uses a 1-chair configuration and includes all features described in the PPR model.

CCD Model

The CCD model, in place at Intermediate School 143 in Washington-Heights, functions as a freestanding clinic in the school and includes 2 operatories, a laboratory, waiting room, and back office. Services include all those in the PPR model, endodontic and limited exodontia, space maintenance, prosthodontic services, fabrication of mouth guards, and emergency services. The CCD model functions in a school that has extended hours and is designated as a Beacon school. The Beacon school provides a comprehensive array of community services after hours. Community-based organizations conduct the after-hours programs. CCD staff work with school staff during school hours and in conjunction with the community-based organization after hours. This model includes dentists, hygienists, dental assistants, and support staff. Screening and preventive activities are conducted via outreach by CCD staff to Head Start and day care facilities, surrounding schools, and community clinics without dental services. Children seen are then referred to the CCD or to CUSDOS when indicated.

Primary Considerations

Total patient encounters vary in the school-based paradigms. P and S models are usually part-time operating 2 to 3 days per week in a school. PPR, CCD, OC, and C models operate on a full-time basis, 5 days per week, 12 months per year. Clinic productivity goals are set at 2,400 visits per full-time dentist and 1,800 visits per full-time hygienist. Visit numbers can vary from 1,200 per year in a P or S part-time facility to approximately 4,000 in the full-time, 2-chair CCD facility.

FACTORS IN SELECTION

Clinic and Professional Staff

All program models described include bilingual staff to accommodate the large Latino population, particularly in schools in Washington-Heights. Clinic and professional staff work with teaching and administrative staff at the schools. Familiarization of school staff with the programs' goals is essential to the success of the system. Clinic staff communicate daily with teachers and administrators. Successful programs emphasize positive relationships with students and dental staff. Children are encouraged to participate as volunteers in some clinics, and staff members often function as mentors and role models. Experiences in the clinic environment are always portrayed as positive by staff. Regular in-service education for clinic and professional staff is provided, with particular emphasis on preventive and treatment modalities that target the needs of the children in the various school-based paradigms.

The P and S models are primarily hygienist centered, with examinations conducted by dentists. The C and PPR model is a dentist/hygienist model. In these models

the dentist conducts restorative care, while the hygienist provides preventive services. The OC model uses the same configuration as that of the PPR model but does not include a dental hygienist. In the CCD model, 1 chair is reserved for the hygienist and 1 chair for the dentist. In all models dental assistants are present. Patient escorts are used, whenever possible, to bring children from the classroom to the clinic for scheduled appointments, in order to complement the professional and assisting staff with clerical tasks. Escorts help alleviate waiting times and are looked upon favorably by teachers and school administrators. Escorts help establish the clinic routine and alleviate confusion or loitering in hallways that can lead to disruptions. Pediatric dental residents and Advanced Education in General Dentistry fellows from CUSDOS rotate through the CCD model. In addition, dental students from CUSDOS obtain exposure to school-based dental services in all models.

Self-Sustaining and Replicable

School-based health care requires capital outlay for construction and resources for establishment and recruitment of staff. Funding sources vary. In the northern Manhattan experience, support has come from the Kellogg and Robert Wood Johnson Foundations, New York State Department of Health grants, Columbia University support, New York City Board of Education school construction authority outlays, and CAS support. Space was provided by school principals in conjunction with the district superintendent of the local school boards, prior to planning and construction of all new dental school-based health programs. The space provided varied and was influenced by (1) age of the school, (2) available space in the school-based clinic (if in operation), (3) availability of additional space in the school, and (4) alternative space in the school identified for clinic use. Space is a critical factor in implementing a school-based paradigm. Inadequate space or poorly located space will result in inability to sustain the model.

Construction costs vary with model type and whether the dental chairs are directly connected to water and waste lines. The CCD model, the most extensive one, can cost as much as \$200,000. P and S models are the least expensive, averaging \$50,000 for equipment and supplies.

In New York State, 35% of students in SBHCs participated in the Medicaid program.⁴ In the CAS and Columbia University programs, 30% to 50% of students participated in the Medicaid program. Self-pay programs, in disadvantaged communities such as northern Manhattan, are neither realistic nor permitted by the boards of education. Further, the addition of a self-pay mechanism in schools would involve additional personnel and added administrative burden for parents, teachers, and school staff and would not assist the program in meeting self-sufficiency.

Where possible, the programs have implemented expanded hours. In northern Manhattan, all CAS schools and several CUSDOS program schools operate with extended hours to provide services to children enrolled in the school, their siblings, and to children in the community. Children not enrolled in the school include preschool children seen through outreach to day care and Head Start programs, neighboring schools and organizations, and students returning for follow-up care after graduation. Summer hours are

difficult to maintain but provide needed services. Many schools conduct classes or community programs in summer. Phone calls to parents and frequent reminders and follow-up are often necessary to maintain clinic productivity during summer. Staff is encouraged to take vacation time during slow summer months.

FINAL PLANNING CONSIDERATIONS

School-based health care is available to students with limited or no financial resources. Zalos et al¹⁰ determined that school-based dental sealant programs can improve the dental health of poor children at minimal cost. Children often have inadequate health insurance, poor transportation systems, and inadequate access to health care services. SBHCs have been shown to improve school attendance. A student with oral health care needs often is faced with chronic pain. School principals in dental shortage areas have limited resources available to them to refer their children. It is not uncommon to have principals recount stories on how children would spend days in the school nurse's office or in the principal's office in pain and unable to function in class because of oral discomfort.

Children with oral health care needs often may not participate in class or miss school.¹¹ A study of students in schools with and without SBHCs found that SBHCs improved student health knowledge and increased student use of health care, especially among students with little access to other health care or with greater need for health care.¹² When school-based oral health care services are present at school, children come to school for clinical treatment; they do not avoid it. Children can then attend class and benefit from the ability to learn in an environment free from pain. Poor oral health has been associated with diminished school performance; children experiencing pain can be distracted and are unable to concentrate on schoolwork.¹³

Successful implementation of school-based services involves several steps. First, planning is critical. Without adequate planning, services will be disorganized and may fail to reach the children in need of services. Planning for a school-based clinic should include assessment of the demographics of the community including population, oral health of the population, and access to services. Second, the school system, its organization, and leadership should be ascertained and contacted before embarking on a program. Participation in community and school board meetings and joining and working with community-based organizations are helpful. Third, obtaining institutional support of the sponsoring organization is necessary to sustain the program. Institutional support includes adopting school-based health care as a component of the mission of the organization. Institutional support also includes a provision for capital construction and the provision of time for staff to develop a viable model and to develop contacts in the community and school-based sites. Long-term support from institutions includes administrative support and expertise. This often includes providing an administrative coordinator with responsibility for maintaining the programs' databases and personnel. Financial support from the institution is necessary to maintain program viability.

When selecting a model, the institution, school, and community must ask, "which system works best for us?" Screening may be more appropriate than primary prevention

if such services can be provided nearby. Primary restorative is recommended over prevention, when the restorative needs of children are not addressed adequately. Cost of services is a critical factor in selecting a model. A community may need a CCD model because of an inadequate oral health delivery infrastructure and a substantial student population in need of care. However, if adequate capital is not available for the substantial outlay needed for the construction of a facility, alternatives should be explored. When possible, linking oral health care services to schools that already have a school-based program reduces some program obstacles for developing and establishing a SBHC. School administrators, community groups, and parents will already have an established relationship in place and often will have addressed the addition of oral health services. Capital expenditures may be reduced because of access to support services such as storage, computing, and waiting areas. An existing administrative infrastructure may be available for expansion to and inclusion of dental services. Corresponding operating expenses will be substantially reduced for an oral health care program when dental services are added to existing medical services.

Alternative programs to school-based health should be considered when school-based services are not feasible. These may include expanding, developing, or enhancing community access to oral health care in dental offices, clinics, health centers, hospitals, and dental schools. An alternative to fixed school-based health may include providing care in mobile dental vans. Dental vans can approximate the P or S model but are limited in providing services beyond the PPR model.

Programs offered in northern Manhattan by Columbia University and the CAS emphasize access to services. In communities designated as dental health professional shortage areas, poor access to services is common. Programs exclusively preventive or screening in nature, without access to referrals through an anchor program, will not reach successful outcomes or achieve sustainability. Similarly, the more comprehensive models, the PPR and CCD programs, necessitate links for specialty services to render appropriate treatment. School-based health programs cannot succeed if links do not exist. In the northern Manhattan programs, staff have consultation referral forms and access to dental services at community health centers, ambulatory care centers, and the School of Dental and Oral Surgery. In these instances, staff are part of the community network of services in the Columbia and CAS networks.

Development of a school-based comprehensive and cost-efficient oral health care program requires careful planning centered on community needs. Gaining the support and cooperation of school officials and parents creates an environment that has a significantly greater opportunity for success. Further, location, appropriate facility design, and support from a local charitable organization are factors that contribute to improved access and expedited care.¹⁴

CONCLUSION

School-based health programs provide oral health care services to children in underserved communities. Successful school-based models always include a positive relationship with school administrators, parents, teachers,

and other staff. This relationship is key to program success in obtaining valid patient-parental consents and permission to bring children to the dental clinic. To maintain such a relationship, dedicated school-based program staff is important, complemented by dedicated program directors who collaborate with school administrators, principals, and district supervisors to ensure program longevity. SBHCs may serve as the students' primary care provider or complement services provided by other health care providers. SBHCs are an important link to ensure that children receive the health care that enables them to remain in class. Staff commitment to program goals is also essential to program success. When parents and community members support school-based dental health services, and adequate facilities and space are available, successful paradigms can be implemented. ■

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