Mobile Dental Vans: Planning Considerations and Productivity

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Abstract

Objectives: *Many children, especially those from lower socio-economic families, have limited access to dental care, transportation problems and poor appointment attendance. Mobile dental clinics have been implemented in many communities to address these issues.* ***Methods:*** *Structured surveys were sent to the three mobile programs in Connecticut to collect information on the age of the program, issues encountered in planning and implementation, and ongoing costs and productivity.* ***Results:*** *Each mobile clinic had two operatories and operated 140-200 days per year. Programs provided 2921-3417 diagnostic and preventive procedures and 359-721 treatment procedures per year for an average daily production of 18-24 procedures. All programs required external funding to remain financially solvent.* ***Conclusion:*** *Implementation and management of these programs is complicated. However, they provide an innovative solution to bringing dental care to underserved children and when operated in conjunction with schools can eliminate transportation problems and missed appointments.*

Key words: Mobile dental clinics; access to dental care; dental care delivery

Introduction

Children from low socio-economic families exhibit significant levels of decay (1), experience limited access to care (2), often lack transportation(3) and have high "no-show" rates (4). These children typically reside in inner city or rural locations and have Medicaid or no insurance. Safety net providers such as community health centers and school-based health centers help fill this void in care delivery. Typically, three options are available for the delivery of services: 1. Traditional stationary clinics; 2. Portable equipment; or 3. Mobile dental clinics (van or truck). Each delivery option has advantages and disadvantages (Table 1). Although many mobile dental clinic programs have been implemented, only one published paper provides information on program pit-falls, costs and productivity (5).

This paper will describe implementation issues of the three mobile dental clinic program currently established in Connecticut and document their productivity and ongoing costs.

Methods

After preliminary investigative visits to each mobile clinic, a 29-item structured survey was designed and sent to each program. Information on program age, issues encountered in planning and implementation, and ongoing costs and productivity for the last financial year were obtained. The survey was followed-up with personal interviews. Information was predominantly collected from the person responsible for program administration.

Results

All mobile dental clinics contained two operatories, an x-ray unit, waiting area and office space and predominantly served medically healthy elementary aged children. The Hartford City Public Schools "Molar Express" comprised a 30-ft. Winnebago van. The Hospital of Saint Raphael's "Smiles 2 Go" comprised a 65-foot articulated tractor-trailer, which included a dental laboratory and was associated predominantly with the New Haven inner-city school system. The Generations Family Health Center "Across the Smiles" comprised a 40-foot long flat-bed truck and predominantly delivered care through school districts in the rural northeastern part of the state. The latter two units were wheelchair accessible and included a rest room.

Initial costs of $210,000 to $288,000 for vehicles, equipment, instruments and start-up supplies were obtained from grants or charitable endowments (Table 2). Smaller mobile units, such as Hartford's, required external power sources at each visit site to run equipment and heating/air conditioning. Power sources were strongly recommended for medium sized units, such as Generations that have on-board generators. External power sources cost approximately $2,500 per site to install but increased generator lifetime. The St. Raphael program uses only the on-board generator; although noisy it has been problem free.

Mobile units must be garaged in heated space to maintain security and protect against waterlines freezing resulting in damage and lost service days. Adequate garage space was difficult for all three programs to locate. St Raphael's garage is not heated but the mobile unit is connected to a power source to provide on-board heat.

Maintenance and fuel costs varied depending on the type of unit and the geographic area serviced. Other up-

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TABLE 1
The advantages and disadvantages of various delivery systems

Fixed Site Clinic

Disadvantages	Advantages
High start-up costs	Moderate ongoing costs
Patient transportation	Efficiency
Poor patient attendance (High No show rates)	Comprehensive services
Target population proximity	Easy and reliable computer and phone access
Local business and governance not receptive	Patient record access/storage
	Follow-up services easy

Portable Equipment (utilized in schools)

Disadvantages	Advantages
Space required at each site	Low start-up costs
Limited services	Low ongoing costs
Liability is with the school	Multiple sites
Target sites not receptive	High productivity possible, especially with prevention
Logistical concerns	Can remain on site for extended periods
Confidentiality	Excellent patient attendance
Patient record access/storage	Treat child without parent
Need vehicle to move equipment	Transportation issues eliminated
Compliance issues with State and Federal laws	Computer and phone access can be achieved

Mobile Dental Clinic (utilized predominantly with schools)

Disadvantages	Advantages
High on-going costs	Moderate start-up costs
High administrative needs	Multiple sites
High productivity difficult	Excellent patient attendance
Permission for site use	Treat child without parent
Location of appropriate parking	Transportation issues eliminated
Limited services	Liability is with the provider
Patient record access/storage	
Computer and phone access difficult	
Multiple weather related problems	
Follow up services difficult	

keep costs included registration and liability and vehicle insurance (Table 2). The driver is integral to the program and is responsible for driving the unit from the garage to the site in the morning and returning it at the end of the day. Additionally the driver managed vehicle maintenance, appropriate parking, unit set-up, and vehicle and patient safety. Some programs tried part-time drivers but this required a staff person to shuttle the driver between the site and garage. Ideally the driver is an integral part of the care delivery team, assisting with unit set-up, shepherding children between classrooms and the dental unit and stowing equipment at the end of the day.

Clinic staffing depended on the type of services delivered, but in all programs the staff had to function well as an independent team and assume a wide range of duties. Overall, more hygienists were employed than dentists (Table 2), an appropriate finding for outreach programs which emphasize screening and preventive services. No program had a pediatric dentist although the majority of patients were children, and all had problems recruiting and retaining dentists (5). Some faced similar issues with hygienists.

Additional costs (not reflected in Table 2) that varied significantly by parent institution included billing services, telephone (cell and land line) and computer costs, mileage expenses for staff, marketing and photocopying as well as the cost of removing or processing medical waste and pumping waste water tanks. In programs that were largely community-based rather than school-based, marketing costs were significant.

An adequate patient base was vital. A large number of sites increased program complexity due to travel time and varying paperwork and site requirements. In contrast, sites had to have enough patients to warrant several return trips to limit time wasted returning to treat a few patients. The Hartford program operated at only two schools in one city due to sufficient numbers of children requiring dental care. In contrast, the Generations program operated at 40 dispersed rural sites and found scheduling and protocol logistics decreased productivity. Although the Saint Raphael's program operated at 3 state child agencies and 15 schools, the schools were mostly within one city school district with uniform paperwork.

Effective Care Coordinators and Program Managers combined with strong data management were important in maintaining a full schedule for all providers. Typically, after consents and medical histories were obtained from patients, hygienists staffed the first site visit. Examinations and preventive services were performed and children needing restorative care identified. Once sufficient restorative patients were identified the unit returned with a dentist. As restorative needs were completed, often the last few patients were referred to a static site for completion of care to save dentist time. The Saint Raphael program always operated with a dentist on-board which simplified scheduling but increased costs.

TABLE 2
Connecticut mobile dental clinics

	Hartford Public Schools	St. Raphael's Hospital	Generations Family Health Center
Initial purchase costs			
Year of Purchase	2000	1999	2001
Unit Type	Winnebago	Tractor-trailor	Fixed-bed Truck
Unit Purchase Cost	$170,000	$248,000 (Included some smaller equipment)	$250,000
Instruments/supplies	$40,000	$40,000 (Included supplies for 2 years)	$25,000
External Power Source	Covered by parent organization	Not required	$2,500 per site
Ongoing annual costs			
Garaging	Covered by parent organization	$9,000	Donated
Maintenance	$2,000	$6,500	$3,100
Registration	Covered by parent organization	$1,035	$370
Insurance	Covered by parent organization	Covered by parent organization	$4,800
Fuel	Covered by parent organization	$1,500	$1,800
Driver	$27,000 (Full-time)	$26,000 (Full-time)	$18,000 (as needed)
Dental unit staffing			
Dentist	0.2	0.75	0.6
Hygienist	0.4	1.0	1.2
Dental Assistant	0.3	1.0	1.0
Care coordinator	0.6	Part of hygienist responsibility	0.25
Program Manager	Part of school's dental dir. resp.	Part of hygienist responsibility	0.5
Annual mobile dental unit production			
# days in service	140*	200	180
# sites serviced	2	18	40
Patient revenue	$62,000	$90,000	$138,000†
Revenue per service day	$440	$450	$770
% Medicaid	98%	92%	86%
Diagnostic/ Preventive proc.	2950	3417	2921
Treatment proc.	470	721	359
Procedures per day	24	21	18
# children served (estimate)	1700	1500	1030

*Only operates 3 days per week.
†This figure reflects the federal subsidized visit rate available for care delivered at federally qualified health centers.

Productivity of the mobile clinics was also dependent on the number of days the mobile unit could be fully functional. Reasons for non-utilized days included: routine maintenance; lack of driver or other staff; vacation; or inability to locate a suitable site. Weather-related issues which led to non-utilized days included: inadequate on-board heaters; lost heated garage space; sub-zero weather causing frozen water lines during travel; schools or roads closed due to inclement weather; and potholes in spring which jarred delicate equipment and increased maintenance needs (6). Additionally, extremes of temperature affected storage of dental supplies if adequate heating and cooling was not provided.

The majority of patients served were on Medicaid, which reimburses at the 1st to 6th percentile of fees compared to national usual, customary and reasonable fees (7). Both the Hartford and Saint Raphael's program billed Medicaid and received standard fee for service payments. The Generations program, as part of a federally qualified health center, was eligible for a federal subsidized visit rate, accounting for the higher revenue per day although fewer procedures were completed (Table 2). The revenue generated by the programs did not cover the salaries and ongoing costs of the units.

Discussion

The decision to utilize mobile dental clinics should be made cautiously as there are many pitfalls and failed programs (5). In a national survey of dental school mobile units, nine were operational, three were being planned and two were discontinued (8). It is important during planning to speak to managers of other pro-

grams that are similar in terms of: climate; geographic area; target population; services delivered; and parent organization. Each of these factors has unique implications for the design, implementation, management and sustainability of programs.

The revenue stream for mobile clinics is limited as high productivity is difficult to maintain and Medicaid and lower socio-economic patients are predominantly served. Preventive services are typically more cost effective and easier to deliver than restorative services. A program in Pender County, North Carolina abandoned providing restorative services as the limited space hampered the effectiveness of the dentist. They now utilize a fixed site that works in conjunction with their mobile program (5). Some Connecticut programs use a similar system for complex restorative patients.

The Pender County program sees 13 patients per day in the fixed site and 16 patients per day on the mobile unit (for diagnostic and preventive services) (5). The 3646 diagnostic and preventive services delivered predominantly on the mobile unit are comparable to the Saint Raphael's program. In contrast the Pender County program delivered 1557 treatment procedures and received $161,333 (for all procedures) (5). These figures are higher than those for the Connecticut programs but they include the production from the fixed and mobile sites. Additionally, the Pender County program fees are substantially higher than Connecticut Medicaid fees. The Generations program, which receives federal subsidies for its services, has been increasing productivity and in the next financial year expects to receive $205,000 in patient revenue. However, this will still not meet total program costs of $350,000 which includes all personnel, operation, administration and unit depreciation costs.

Mobile dental clinics provide an innovative solution to providing dental care to underserved children. They decrease missed appointments when run in conjunction with schools, and directly address transportation problems, a frequently cited factor contributing to "no shows" (9) (10). However, the costs and complexities of running these programs should not be underestimated. It is unlikely that mobile dental clinic programs serving low-income populations can be self- sustainable without subsidy.

Acknowledgements

I would like to extend thanks to the following individuals for their contribution of ideas, information and data: Diane Dimmock, RDH, Dental Director, Hartford Public Schools, Hartford, Connecticut; Sharon McCreven, RDH, Program Manager, Smiles 2 Go, Hospital of St. Raphael, New Haven, Connecticut; and Margaret Ann Smith, DMD, Dental Director, Generations Family Health Center, Willimantic, Connecticut.

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