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New Jersey FQHC Community Dental Health Coordinators Use Integrated Medical/Dental Patient Navigation to Improve Diabetes Outcomes

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ABSTRACT

Introduction: *Diabetes is a significant risk factor for periodontal disease [2] and people with diabetes are three times more susceptible to periodontitis than those without diabetes [3]. These factors highlight the importance of aggressive treatment and follow-up of dental treatment for patients with diabetes, as well as coordination of care between the medical and dental teams.*

Zufall Health Center, a New Jersey federally qualified health center (FQHC), designed a process improvement plan at two project sites to promote better diabetes management by performing dental exams and cleanings and treating periodontal disease by scaling and planing in at least 100 high-risk, rural patients with uncontrolled diabetes, as measured by A1C. Baseline goals included completing periodontal treatment and improving A1C levels.

Methods: *Zufall deployed a community dental health coordinator (CDHC) to provide community-based prevention, care coordination, education, and patient navigation of wrap-around medical and oral health services for Type 2 patients with diabetes it serves. Key objectives included decreasing the number of patients with diabetes with A1C levels > 9 and increasing the number of dental exams and cleanings.*

Results/Conclusions: *Of 154 enrolled patients, 103 with uncontrolled diabetes opted in to dental services. Of the 37 patients who completed cleanings or scaling and root planing (24%), 17 showed improvement in A1C levels (46%) by an average reduction of 1.8. Nearly all (15 of the 17) went from uncontrolled to controlled diabetes: 40% of the 38 patients receiving dental treatment. However, 70 of the 99 patients (70%) re-checked for A1C levels improved those levels, regardless of their participation in dental care. Traditionally, most improvement is achieved through medication adjustments. This data shows that, while the thrust of the project was the impact of dental interventions on A1C levels, the more critical intervention was the case management and access to care facilitated by the CDHC.*

Keywords
CDHC, Diabetes, Oral Health, Periodontal Treatment, Team Integration.

Introduction

Diabetes, a rampant disorder of high blood sugar that affects 37.3 million people in the US (11.3% of the population; 23% undiagnosed) [1], is a significant risk factor for periodontal disease [2]. People with diabetes are three times more susceptible to periodontitis than those without diabetes [3]. Poor glycemic control can increase both the incidence and severity of periodontal disease [2,4,5]. At the same time, research also shows that periodontal disease is a significant risk factor for diabetes [2,4,5]. Periodontal inflammation and untreated disease can increase a patient's risk of higher blood sugar levels and poor glycemic control, leading to ineffective disease management and uncontrolled diabetes [2,4,6].

The symbiotic, cause-and-effect relationship of these common, chronic diseases [4,7] highlights the importance of continual treatment and follow-up of periodontal disease for patients with diabetes. Coordination of care between the medical and dental teams of these patients is critical to successful disease management [8].

It is an especially important time to address the management of these two diseases. While the Centers for Disease Control and Prevention (CDC) Diabetes Report Card 2021 showed the first decrease in the number of newly-diagnosed US diabetes cases in twenty years, the number of patients learning they had prediabetes nearly tripled. Diabetes was also designated a principal underlying condition contributing to the risk of severe illness from COVID-19 (four in ten adults who died of coronavirus had diabetes). The highest rates of diabetes in 2018-2019 occurred in Native Americans and Alaskan Natives, followed by Black and Hispanic adults [9]. COVID mortality rates correspond with the prevalence of diabetes in these populations [10].

Zufall Health Center, a New Jersey federally qualified health center (FQHC), designed a process improvement plan to provide community-based prevention, care coordination, education, and patient navigation of wrap-around medical and oral health services for Type 2 patients with diabetes in two rural communities it serves. The objective of the grant-funded program was to improve diabetes management by actively treating periodontal disease in at least 100 high-risk rural patients with uncontrolled diabetes as measured by A1C, a common blood test to monitor a patient's management of blood sugar levels. Because periodontal disease is a risk factor that exacerbates diabetes [2], these important oral health services would be a vital part of the medical treatment plan. The lynch pin of the year-long program was a community dental health coordinator (CDHC).

Zufall serves approximately 8,000 patients at the two targeted rural sites in northwestern New Jersey. Because the state is primarily suburban/urban, low-income, working-poor residents of this relatively remote area tend to fall off the healthcare radar. Seasonal and migrant farm workers, immigrants, and people without transportation are often isolated and face daunting barriers to quality-of-life and primary healthcare services. This is especially true in the case of clinical management of patients with diabetes, due to the number of office visits required for monitoring and minor interventions, as well as the effects of everyday life on disease control. CDHCs are specially trained to bridge the access gap and navigate these patients past the challenges of language, transportation, culture, and financial constraints to the oral and medical healthcare they need.

About CDHCs

The result of a 2006 initiative by the American Dental Association (ADA) to address a lack of available dentists in underserved areas and extend oral health services to a wider and more diverse population, CDHCs are dental hygienists and assistants who are trained as community health workers to navigate patients to appropriate dental services. CDHCs coordinate care and manage cases; build bridges from the community to the dental clinic by addressing social determinants of health; improve continuity of care; resolve barriers to care (transportation, housing, language, etc.); and enhance the health literacy of patients. Because CDHCs often come from the communities they serve, they are uniquely positioned to become the trusted health education resource for patients. Their mission for the communities they serve is to improve health outcomes by understanding and eliminating the barriers to accessing and following through on dental care.

About Zufall Community Health Centers

Established in 1990, Zufall Health serves patients in northwest and central New Jersey. In 2021, the center supported 41,497 patients with 175,856 visits across six suburban/urban counties and nine sites, including seven dental offices and two mobile medical/dental units. Zufall serves low-income, medically underserved populations, with a special focus on homeless individuals, public housing residents, and farm workers: 88% of patients are below 200% of the federal poverty level, 53% of patients are uninsured, 74% of patients identify as Hispanic, and 66% of patients are best served in a language other than English.

Methods

The process improvement project's overarching goal was to improve the control of Type 2 diabetes by addressing periodontal disease in adult patients with diabetes at Zufall's Hackettstown and Newton clinics in rural Sussex and Warren Counties. Key objectives of the year-long program (July 19, 2021 to June 30, 2022) included decreasing the number of patients with diabetes with A1C levels > 9 (9%) and resolving periodontal disease. The crux of the project was to add patient navigation and case management by CDHCs to facilitate access to whole patient care delivered by an integrated medical/dental team model.

Zufall has a history of successfully uniting seamless, transparent oral and medical health care services to patients, thanks to its

fully electronic health record and dedication to a patient-centered response. Positive integrations have included blood pressure screening; nutrition education (diabetes and BMI); and oral cancer prevention, such as education on tobacco use, substance abuse, and HPV. Diabetes management was a logical next step on Zufall's integration journey.

Since 2009, Zufall has tripled its dental health service capacity and quadrupled the number of patients receiving oral health care. In the same time, Zufall has demonstrated a good track record of using clinical pharmacy and medication therapy management to treat patients with diabetes. During July 2020 to June 2021, 67% of Zufall patients with diabetes maintained controlled diabetes, surpassing the statewide FQHC average of 60.3% and the national FQHC average of 64.4%. In the targeted project area of Newton and Hackettstown, baseline rates before project implementation (July 2020 to June 2021) were 69% controlled and 31% uncontrolled.

Creating a Process

The first step in the process improvement program was to hire and train a lead CDHC to navigate the target community of rural, underserved patients to appropriate, integrated oral and medical healthcare. The CDHC was trained to use The Model for Improvement's proven PDSA program development methodology (Plan, Do, Study, Act) to develop, implement, evaluate, and document program efforts. This rigorous improvement model required constant refinement of goals and activities, and used data-driven, evidence-based decision-making to determine needed changes, to measure the impact of change on processes, and to track outcomes, including a project summary of best practices.

Next, the CDHC developed a procedure to enroll patients for the project. Working with the Patient-centered Medical Home Coordinators (PCMHs) at the two rural project sites, data from the electronic health record was used to identify patients with uncontrolled diabetes, based on A1C measures. The team planned to recruit ten patients a month, with a program goal of 100. The project recruited 154 patients with uncontrolled diabetes over the project year (July 2021 - June 30, 2022). There were 1005 patients with uncontrolled diabetes at the non-participating Zufall sites during the same time.

Patient Engagement

The CDHCs used HIPPAA-compliant platforms to connect with patients. The team addressed disease management indicators in one-on-one interactions in person and virtually via Zufall's telemedicine portal, which helped them coordinate care, schedule appointments, and monitor progress for program participants. To overcome barriers to health services, they aligned oral and medical health information with each target patient's language, culture, and values system.

A key component of integrating care was the implementation of bi-directional communication with the PCMHs for medical services, with staff clinical pharmacists for medication management, and with team nutritionists for diet and lifestyle support, as well as with external partners including the Diabetes Foundation.

To make compliance easier, they deployed LumaHealth's vital two-way text messaging program to schedule patient appointments and follow-ups, to communicate about medications and helpful resources, and to share details of health education workshops and cooking classes sponsored by community partners, such as the Diabetes Foundation. The CDHCs actively monitored patients' A1C levels, and noted which patients were improving and which were not, to inform next steps in care coordination.

Process Improvements

CDHC interventions included assisting patients in managing their dental treatment plans, scheduling dental appointments, and monitoring gingival health; collaborating with Zufall medical providers to monitor and follow up on diabetes management; referring patients to the center's clinical pharmacy team for assistance with managing medications; and connecting patients to the Zufall nutritionist for education and support on healthy eating habits. Integration does not work without collaboration. Because Zufall is a large health center with scarce resources, it was difficult to connect patients with the pharmacy and nutritionist due to high demand from other patient groups, such as HIV and colon cancer. As part of the ongoing process improvement, the CDHCs brainstormed strategies with the pharmacy and nutrition teams to increase the number of patients with diabetes accessing services.

As trust built and the number of enrolled patients with diabetes from the two rural sites grew, dental and medical staff established scheduling blocks to reserve appointment times for the program participants. The CDHCs further improved process efficiency and enhanced patients' access to care by directly and immediately scheduling appointments during outreach phone calls to patients, instead of handing off appointing to the front desk to manage at a later time. A central dashboard was developed to report on patient outcomes.

In alignment with Zufall's commitment to whole-patient care, CDHCs leveraged health education to effect behavior change. CDHCs connected patients to free, educational disease self-management workshops offered via the Diabetes Foundation.

Due to the continuing effects of COVID, patients with diabetes were often reluctant to visit the Center in-person. Sensitive to those fears, the CDHCs bridged that gap and created a virtual intake process to enroll more patients in the program. They worked to reschedule patients who were either no-shows or had canceled appointments due to concern about the virus. They also followed up on procedures and treatments and connected patients to additional services, an especially invaluable contribution during a time of staffing shortages caused by the pandemic.

Continuous Quality Improvement and Measurement

Ongoing staff trainings, evaluation, and continuous quality improvement driven by clinical outcomes recorded in the patient

medical record were important elements of the project. Zufall uses a QA/PI (quality assurance and performance improvement) model to assess the impacts of services and interventions on processes and outcomes, which then informs corrective action. The agency-wide program provides ways to monitor operations, conduct peer review, and provide feedback on performance based on national and evidence-based standards. Zufall also established reporting databases and dashboards to identify patient data for implementing interventions and to track outcomes.

The team used the PDSA model to organically evolve the program, making and testing changes every step of the plan. Through a careful process of planning a change, implementing the change, studying and analyzing the effects of the change, and then acting from the gathered data, the CDHCs were able to evaluate outputs and outcomes of patients' control of their A1Cs, based on completion of dental treatment. The CDHCs tracked metrics and milestones with a PDSA log, which included their comprehensive feedback, as well as input from the medical team, dental staff, and PCMH coordinators. The log also recorded data from the EHR showing the number of patients the CDHC reached and the prevalence of timely coordinated medical/dental visits, the number of patients receiving a cleaning or completing their scaling and root planing, and the number of patients reached by LumaHealth and linked to external workshops on managing diabetes.

Overcoming Challenges

A primary challenge was the continuing impact of COVID, which contributed to staff shortages and limitations, as well as to patients' discomfort with in-person visits, making it difficult to schedule appointments. Another issue was the significant number of no-shows, cancellations, and rescheduling of appointments, despite reminders from the CDHC and the text messaging system. An ongoing challenge is the need for a comprehensive, central dashboard to aggregate metrics. In addition, like many healthcare facilities, there is the constant struggle to hire support staff. As community health workers, CDHCs are specifically trained to listen for and address barriers to care, whether it is a pandemic or social determinants of health. CDHCs developed a plan to reach out to 100% of no-shows to assess barriers and encourage rescheduling appointments.

Along with COVID concerns, they discovered patients were missing appointments due to childcare issues and lack of transportation. They overcame these barriers by providing consistent, timely information to patients about transportation assistance, Zufall's rigorous COVID-19 protection measures, and the importance of oral health on overall health. To counteract the effects of the Omicron surge, Zufall implemented virtual and group sessions for some services, such as nutrition education, cooking classes, etc.

To address the staffing shortage, Zufall pioneered an in-house dental assistant training program, teaming up candidates with Center dentists for training and education. To meet the growing demand for appointments and care, to counter the loss of a dentist at one of the sites, and to address long wait times, Zufall shifted dentists from other Center clinics to the project Hackettstown site twice a week. Zufall also launched a CDHC training program, a first of its kind in a FQHC and in partnership with ADA (American Dental Association), and graduated its first students to assist in its growing diabetes management program.

Results

The process improvement program exceeded its goal of recruiting ten patients with uncontrolled diabetes per month (total of 100), with a grand total of 154 patients over the project year (July 2021 - June 30, 2022). Of the 154 recruited patients, 103 opted in to some form of dental care at Zufall, 22 were seen by outside dentists, and 29 chose not to see a dentist for reasons including co-pays and transportation. Per the project objective, at the end of the first year, 64.3% of the patient cohort was re-checked for A1C levels (99). This compares to 41.9% (421) of 1005 patients with diabetes re-checked for A1C levels at the non-participating Zufall sites.

Performance measures over the project year were significant and positive. The CDHCs coordinated care for 103 patients. They recorded a total of 193 dental case management encounters using ADA codes 9991, 9993, and 9994, which address appointment compliance and transportation barriers, motivational interviewing, and case management. This did not include medical, pharmacy, nutrition, or telephone encounters. More than 1000 appointments were scheduled. Of more than 400 dental appointments, the no-show rate was 13%. This is less than the Zufall no-show average of 20% and reinforces the impact of CDHC efforts. CDHCs followed up with 100% of patients who were no-shows to assess barriers and reschedule appointments.

Table 1: Interventions impacting key objectives during the project year (2021-2022).

TABLE 1. Interventions Impacting Key Objectives (Project Year 2021-2022)	Values
Number of dental case management encounters with CDHCs	193
Number of dental appointments	~400
Number of medical appointments	~600
Number of consultations with pharmacist: n=28	27.18%
Number of consultations with nutritionist: n=37	35.92%

Due to improved access, 37 uncontrolled Zufall dental patients with diabetes completed cleanings or periodontal scaling and root planing (24%). Seventeen of those (46%) showed improvement in A1C levels by an impressive average of 1.8. In addition, nearly all, 15 of the 17, moved from uncontrolled to controlled diabetes (40% of the 37 receiving a cleaning or scaling and root planing). However, 70 (70%) of the 99 patients re-checked for A1C levels improved by an average of 1.2, regardless of their participation in dental care; 38 (approximately 38%) moved from uncontrolled to controlled diabetes. Data from non-participating Zufall sites during the same time period showed 211 (50.1%) improved their A1C levels by an average of 1.11; only 23 patients (5.5%) at non-participating Zufall sites moved from uncontrolled to controlled diabetes.

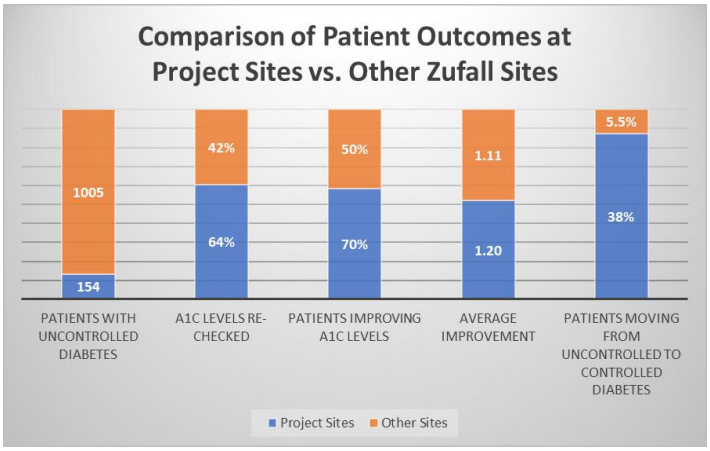

Figure 1: Comparison of patient outcomes at project sites vs. other Zufall sites.

Referrals to Zufall's clinical pharmacist and nutritionist increased with the return to in-person visits by some patients previously concerned about COVID. Of 103 patients whose care was coordinated by CDHCs, 28 (27.18%) interacted with pharmacists and 37 (35.92%) were referred to the nutritionist.

Table 2: Results of Process Improvement Program (July 21, 2021 - June 30, 2022)

Process Improvement Program (July 21, 2021 - June 30, 2022)	Values
Total cohort	154
Patients with uncontrolled diabetes engaged in some form of dental treatment: n=103	66%
Patients with uncontrolled diabetes completing cleaning or scaling and root planing: n= 37	36%
Patients with uncontrolled diabetes improving A1C levels after completing cleaning or scaling/root planing: n=17	46%
Patients moving from uncontrolled to controlled diabetes after completing treatment: n=15	40%
Average A1C improvement	1.80

Programs designed to address the staff shortage and limitations increased access to dental care. Zufall's CDHC student training program, in partnership with ADA (American Dental Association) and the first initiative of its kind at a FQHC, graduated ten students in September.

Conclusions

While the project exceeded its goal of using dental care to decrease A1C levels of patients with diabetes, data showed that 70 of 99 engaged patients improved A1C levels, regardless of their participation in dental treatment (70%). This finding indicates that, while the thrust of the project was the impact of dental interventions on A1C levels, the more critical interventions were case management, education, patient navigation, and access to care facilitated by the CDHC.

This project significantly improved A1C levels by deploying case management and patient navigation into dental and periodontal treatment by CDHCs to increase control, effectively achieving the desired outcomes.

During the process improvement program, it was discovered that nearly half of monitored dental patients were uninsured. This fueled the desire to devise a way to make certain patients without coverage have access to the same number of visits as patients with health insurance.

The process improvements, including creating innovative ways to address staffing shortfalls, ensure Zufall will be able to handle more appointments, improve access to care, and serve even more patients.

Future plans include seeking funding to provide teledentistry services and collaborating with Zufall's SNAP-Ed team to offer nutrition education and appropriate support for oral health care patients in the targeted rural counties.

Zufall has once again proven the benefit of its history of synergy between its medical and dental staff, seamlessly and effectively partnering in a variety of critical health care services. The Plan, Do, Study, Act framework for process improvement enhances performance and ensures the identification and correction of challenges.

Bidirectional communication and coordination between the CDHCs and the Zufall medical team, including the patient-centered medical home coordinators (PCMHs) and clinical pharmacists, as well as external partners, are critical to successful disease management.

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