

Primary Care/Public Health Partnership for Improved Type 2 Diabetes Outcomes at Roane County Family Health Care

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Introduction

Primary care and public health have overlapping goals of health promotion and disease prevention (Lasker, 1997; Rowan, Hogg, & Huston, 2007; Sloane, Bates, Donahue, Irmiter, & Gadon, 2009). However, competing demands of these two components of the health system create division as primary care attends to the individual patient and public health looks more broadly to population health (Berenson et al., 2008; Busby, Elliott, Popay, & Williams, 1999; Rowan et al., 2007). Given that challenge, there have been various attempts at building models for collaboration (Bradley & McKelvey, 2005; Busby et al., 1999; Hill, Griffiths, & Gillam, 2007; Lasker, 1997). The Chronic Care or Planned Care Model exemplifies the movement toward a clinical integration of primary care and public health (Rowan et al., 2007; Sloane et al., 2009). The Planned Care Model, which grew in popularity through federal initiatives such as the Health Resources and Services Administration's Health Disparities Collaborative, helped foster a population perspective to chronic disease prevention in primary care and helped advance the National Committee for Quality Assurance Patient-Centered Medical Home – a more current effort to link primary care and public health for improved care and outcomes (Barr et al., 2003; Berenson et al., 2008; Bojadziewski & Gabbay, 2011; Nutting et al., 2009; Rosenthal, 2008; Sloane et al., 2009). While there is no single method for collaboration across primary care and public health (Nutting et al., 2009), this case study argues that effective, lasting partnerships are fostered when each partner contributes its strengths, expertise and resources in a way that builds rapport, trust, and allows for change (Busby et al., 1999; Christopher, McCormick, & Young, 2008; Sloane et al., 2009).

The West Virginia University Office of Health Services Research (WVU OHSR) and the West Virginia Bureau for Public Health (WV BPH) have a three-decade history of collaboration centered on chronic disease quality of care improvement, resulting in numerous successful and innovative public health interventions. A more recent effort is a primary care/public health partnership to improve chronic disease quality of care in WV federally qualified health centers (FQHCs) and free clinics which serve at-risk, priority patient populations. Intervention occurs through: 1) use of electronic patient registries and health records for tracking patient care; 2) fostering of quality improvement teams to analyze and apply clinical data to population level care; 3) use of clinical data to inform practice redesign and policy development; and 4) reinforcement of evidence-based care guidelines as appropriate. These efforts are resulting in improved diabetes outcomes (Pollard et al., 2009). Currently, 33 sites share quarterly de-identified electronic patient registry and health record data with the WVU OHSR, totaling

approximately 52,000 patients with diabetes, cardiovascular health conditions, and asthma.

One of the 33 partner sites is Roane County Family Health Care (RCFHC), located in Spencer, WV. RCFHC serves as a case study for sustained, successful collaboration between primary care and public health. RCFHC is a FQHC providing care to patients that are generally underserved, of low socioeconomic status, and at high risk for development of chronic diseases such as diabetes. Roane County has an estimated 8.4% prevalence of diabetes among a population of less than 15,000 (U.S. Census Bureau, 2010; West Virginia Department of Health and Human Resources, 2009), within a state with adult diabetes prevalence significantly higher than the national average (12.3% state compared to 8.7% national) (Centers for Disease Control and Prevention, 2011). RCFHC began a partnership with the WVU OHSR and the WV BPH Diabetes Prevention and Control Program (DPCP) in May of 2006 to achieve improvements in key diabetes outcomes. This partnership is now in its sixth-year.

While not intended as an exhaustive or universal list, three critical factors have helped this particular collaboration mature and evolve. These factors are: 1) practice-driven redesign; 2) shared expertise; and 3) allowance for change. This case study addresses these three particular elements of successful, sustainable partnership. Supporting evidence is triangulated through presentation of key informant reflection coupled with synthesis of available literature, and through results of a type 2 diabetes cohort analysis indicating significant improvements in key indicators.

Methods

Key informant reflection. To gain clinic-level perspective on partnering with the WVU OHSR and the WV DPCP, Emma White, RN, Director of Nursing at RCFHC and a primary driver of quality improvement initiatives at that clinic, was solicited for her participation as a co-author in this work. Ms. White was asked to reflect on this primary care/public health partnership and to describe in writing the various ways in which RCFHC uses their clinical data for quality improvement. Direct quotes and paraphrasing from Ms. White are offered in this case study, and are framed in context of pertinent literature. Screen-shots of jointly developed quality improvement tools are provided as illustration.

Type 2 diabetes cohort patient analysis. RCFHC and the WVU OHSR/WV BPH have a memorandum of understanding in place allowing de-identified data sharing for the purpose of quality improvement and research. De-identified data are shared on a quarterly basis. Analysis was conducted on patients with type 2 diabetes at RCFHC enrolled in the Chronic Disease Electronic Management System

(CDEMS) at the start of registry implementation (5/12/2006) and still enrolled in the registry as of the close of year 5 (5/11/2011) (N = 216). Descriptive statistics and 2-tailed t-tests assuming unequal variances examined differences in baseline laboratory results (5/12/2005 thru 5/11/2006) compared to year 5 laboratory results (5/12/2010 thru 5/11/2011). Criteria for being included in the registry at implementation were a documented diagnosis of diabetes and documentation of an office visit during the baseline period. Baseline data were populated in CDEMS by importing all available, applicable data from the practice management system into the registry. These imports included patient demographic information, laboratory results, and specialty care services when available. To assist with ongoing registry use, an electronic laboratory interface was implemented at the start of registry use to automatically import laboratory results associated with diabetes and cardiovascular health care into the registry. Other data such as visit dates, vitals and specialty care services are hand-entered into the registry for ongoing data maintenance.

Results

Key informant reflection from Ms. White, coupled with pertinent literature on primary care/public health partnerships, reveal three major themes. The themes (practice-driven redesign, shared expertise, and allowance for change) are here presented. When applicable, quantitative results are incorporated to support anecdotal evidence. Screen-shots of jointly developed registry tools are also provided for illustration.

Practice-driven redesign. Practice redesign is a well-established method for improving quality of care (Kilo & Wasson, 2010); the design methods may vary (Bodenheimer, Wagner, & Grumbach, 2002). While the WVU OHSR and the WV DPCP provide resources and expertise that assist in quality improvement and redesign, the sustaining factor is that

RCFHC takes ownership of their quality improvement and redesign processes. Emma White, Director of Nursing at RCFHC, cites discoveries made when reviewing registry data at monthly medical staff meetings shortly after registry implementation. As noted by Ms. White:

We use the Diabetes Summary Report within CDEMS to track practice-wide health outcomes over time. This has led to a complete change in our approach to quality improvement and a complete change in our quality improvement plan such as identifying weaknesses in care (White, 2011).

Based on data from registry summary reports, RCFHC has taken steps to increase the number of patients with diabetes receiving key diabetes services such as yearly dilated eye exams and hemoglobin A1c (HbA1c) screenings: 1) RCFHC added a prompt in their electronic health record to queue physicians and nurses to talk with patients about the need for yearly eye screening, and developed a standard procedure for making referrals to an ophthalmologist when needed; 2) RCFHC purchased a point-of-care HbA1c machine to test patients at the clinic and provide them with direct feedback rather than patients having to wait days for the results. Ms. White notes that “providers and patients are pleased that changes to their treatment plan can be made at the time of the appointment lessening confusion for the patient and increasing compliance” (White, 2011).

Cohort analysis of patients with type 2 diabetes enrolled in CDEMS at the start of registry implementation (5/12/2006) and still enrolled in the registry as of the close of year 5 (5/11/2011) (N = 216) supports claims of the effectiveness of data tracking, reviews, and subsequent redesign. Percent of cohort patients with documentation of dilated eye exams has increased dramatically from 7.4% to 56.0%, and similar and even more extreme improvements are observed in other key diabetes indicators. Table 1 presents these findings.

Table 1. Baseline and year 5 results for number and percent of type 2 diabetes cohort patients with documentation of key diabetes services in the past 12 months.

<u>Measure</u>	<u>Baseline</u>		<u>Year 5</u>		<u>Percent Change</u>
	Number	Percent	Number	Percent	
Dilated eye exam	16	7.4	121	56.0	656.2
HbA1c test	156	72.2	209	96.8	
Foot check	119	55.1	200	92.6	68.1
Influenza vaccination	14	6.5	121	56.0	764.3
Self-management goal setting	1	.05	206	95.4	20,500.0

Analysis of cohort diabetes patients also reveals improvements in outcomes measures from baseline to year 5 measurements. Table 2 presents results from a series of 2-tailed t-tests assuming unequal variances conducted on average laboratory results. Statistically significant improvements are found for total cholesterol, $t(251) = 5.99$, $p = 0.00$; triglycerides, $t(174) = 2.68$, $p = 0.01$; HDL cholesterol, $t(340) = 2.22$, $p = 0.03$; and LDL cholesterol, $t(242) = 4.76$, $p = 0.00$. Average HbA1c from baseline to year 5 measurements remains statistically unchanged.

Table 2. Baseline and year 5 average laboratory results of type 2 diabetes cohort patients with documentation of select laboratory tests in the past 12 months.

	<u>HbA1c</u>		<u>Total cholesterol</u>		<u>Triglycerides</u>	
	Baseline	Year 5	Baseline	Year 5	Baseline	Year 5
Mean	7.45	7.39	205.94	174.85	282.14	200.33
Variance	2.28	1.80	3190.17	1808.69	135851.38	15771.28
Observations	244	488	155	284	155	281
Hypothesized mean difference	0		0		0	
df	439		251		174	
t statistic	0.55		5.99		2.68	
P ($T \leq t$) two-tail	0.58		0.00*		0.01*	
t Critical two-tail	1.97		1.97		1.97	
	<u>HDL cholesterol</u>		<u>LDL cholesterol</u>			
	Baseline	Year 5	Baseline	Year 5		
Mean	45.56	42.95	110.70	92.41		
Variance	130.29	154.14	1413.17	1122.45		
Observations	155	282	134	264		
Hypothesized mean difference	0		0			
df	340		242			
t statistic	2.22		4.76			
P ($T \leq t$) two-tail	0.03*		0.00*			
t Critical two-tail	1.97		1.97			

* Significant at the $p < .05$ level.

Average systolic and diastolic blood pressure results from baseline to year 5 measurements remain statistically unchanged. Table 3 presents these results.

Table 3. Baseline and year 5 average blood pressure results of type 2 diabetes cohort patients with documentation of blood pressure tests in the past 12 months.

	<u>Systolic</u>		<u>Diastolic</u>	
	Baseline	Year 5	Baseline	Year 5
Mean	132.86	133.58	76.22	77.45
Variance	331.73	238.62	102.79	768.07
Observations	450	589	450	589
Hypothesized mean difference	0		0	
df	876		781	
t statistic	-0.68		-0.99	
P (T ≤ t) two-tail	0.50		0.32	
t Critical two-tail	1.96		1.96	

Shared expertise. Clinical information systems benchmark outcomes according to guidelines, provide decision support and help inform practice change (Burton, Anderson, & Kues, 2004; Hanna, Anderson, & Maddox, 2005; Miller & Sim, 2004; Millery & Kukafka, 2010; Murphy, 2010; Vishwanath, Singh, & Winkelstein, 2010). However, for these tools to be fully integrated they often need revision to meet practice needs and preferences. RCFHC not only leverages quality improvement tools made available by OHSR and the DPCP but also helps to design the tools.

In regard to Uniform Data System reporting, which is linked to funding to allow RCFHC to care for patients without adequate health insurance or ability to pay, and other registry tools Ms. White notes:

WVU-OHSR has customized the CDEMS reporting feature to allow us to accurately report the required diabetes data each year thus allowing us to continue to provide care regardless of a patient's ability to pay. We also use CDEMS to populate a list of patients who are lacking an HbA1c, flu and/or pneumonia vaccine or a visit. We then send these patients a customized letter reminding them that these services are due (Figure 1). WVU-OHSR has been instrumental in customizing these letters and the entire CDEMS program to meet our needs (White, 2011).

Figure 1. Registry-generated reminder letter for a patient with diabetes in need of an HbA1c test.



Roane County Family Health Care
146 Williams Drive,
Spencer, WV 25276
Phone (304) 927-1495
Fax: (304) 927-8198

July 18, 2011

Ms. Sample Patient
123 A Street
Samplecity, WV *****

Dear Ms. Patient,

We would like to remind you that your HbA1c is due. It is important to have this test regularly. The date of your last HbA1c was 2/5/2010 with a value of 8.2%. (Values should ideally be 7.0 or below).

The HbA1c helps to show how well your blood sugar has been in control over the last several months. As you know, high blood sugar can cause many complications, including blindness and foot numbness, and current recommendations for the treatment of diabetes include a regular HbA1c test.

To make an appointment for your HbA1c, please call Roane County Family Health Care at (304) 927-1495. You may come in for lab tests at any time. We also ask that if you have had an HbA1c elsewhere, please call to let us know so that we can update our records.

We hope that you will take this opportunity to take care of your health. Our staff is dedicated to helping you with the management of your diabetes.

Thank you,

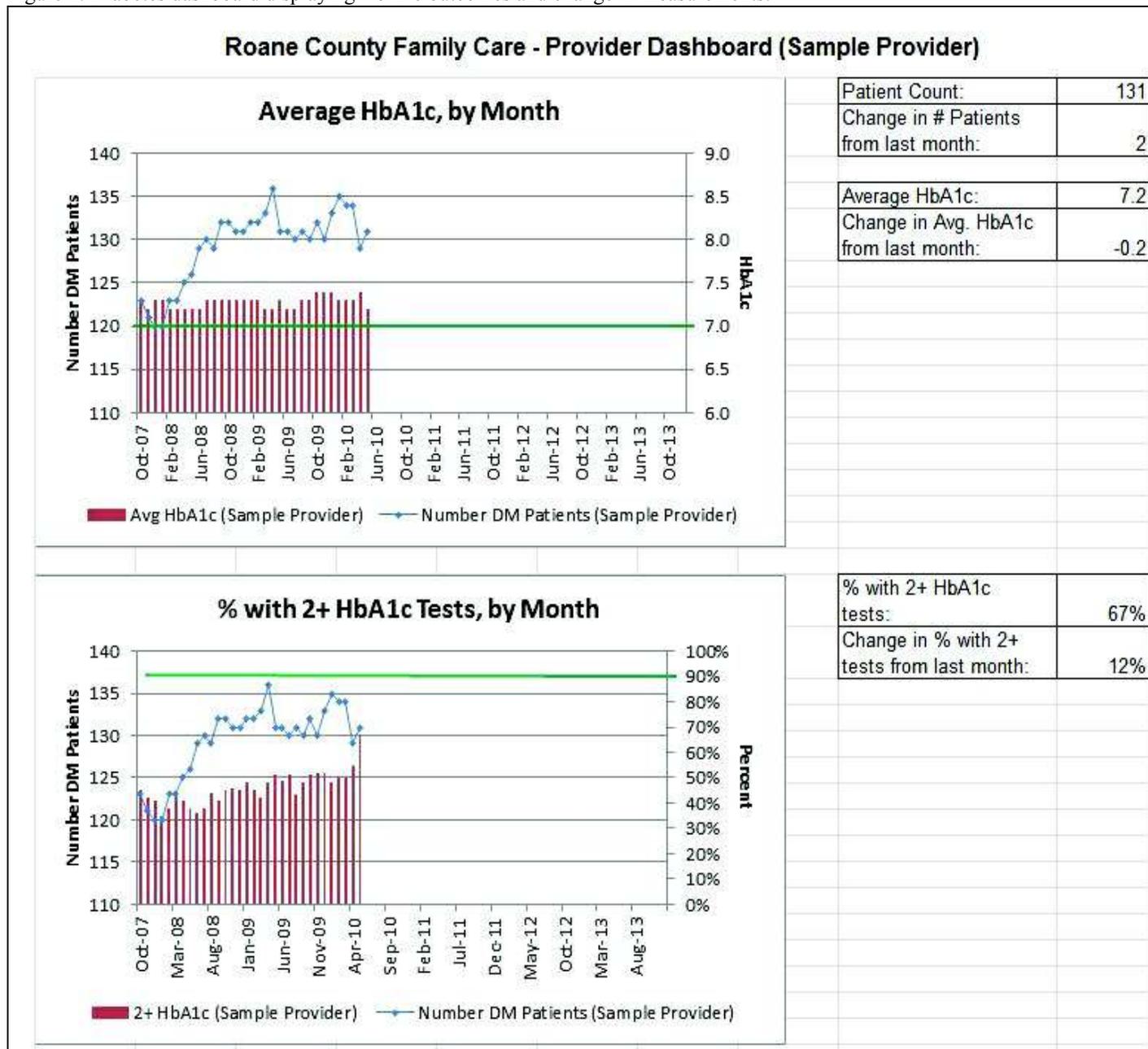
Provider

RCHF also helped to design a provider-level diabetes dashboard which displays longitudinal aggregate outcomes and changes for each panel of patients (Figure 2). As noted by Ms. White:

Each month every provider receives a report of his/her diabetic panel of patients. The report reveals the average HbA1c, percent of diabetes foot checks, retinal exams and other findings. The providers use this data to give better care and to continue to work toward the goals our practice has set. Without the

data, we would have continued to think we as a center were doing everything right (White, 2011).

Figure 2. Diabetes dashboard displaying HbA1c outcomes and change in measurements.



Discussion

Using a combination of key informant reflection and analysis of de-identified clinical data, this study supports the notion of effective, lasting primary care/public health partnership at RCFHC. Findings reveal an increased use of clinical data at RCFHC for type 2 diabetes quality of care improvement, improved tracking of clinical indicators, and statistically significant improvements in some key diabetes outcomes from baseline to year 5 measurements.

While not intended as an exhaustive or universal list of key components to successful collaboration, this study highlights factors critical to this particular partnership. While this is only one case, it nonetheless helps to inform other primary care sites and community health centers, public health, and academic institutions striving for sustainable collaboration. Study limitations, such as only one key informant taking part in this study, should ideally be addressed in future research. Furthermore, using this same study methodology with other partnering WV primary care centers would help to create a more generalizable body of knowledge on primary care/public health partnerships between the WVU OHSR, WV BPH, and partnering WV primary care centers.

With the onset of the Patient-Centered Medical Home, and the push toward meaningful use of electronic health records, primary care/public health partnerships are increasingly vital to meeting the shared goals of improved patient care and outcomes. What began as limited registry use at RCFHC has become a catalyst for continual care improvement. In this particular care, practice-driven redesign, shared expertise and allowance for change were three critical factors in achieving a successful, sustainable partnership helping to facilitate improvements in type 2 diabetes outcomes.

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