HIMSS Davies Ambulatory Award Application

- COVER PAGE -

Applicant Organization: White River Family Practice (WRFP)
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Menu Item: **Population Management & Patient Engagement**
Specific NPSG and/or NPP goals addressed:

NPP:

- Improve health of the population.
- Engage patients and families in managing health and making decisions about care.
- Remove waste and achieve effective, affordable care.

Executive Summary

WRFP installed an integrated electronic health record (EHR) system in 2010. Following initial training and system configuration, WRFP began using the EHR to systematically improve our provision of four priority primary clinical care elements as detailed in our Clinical Value core case study. Our practice then applied our EHR to improve the healthcare of defined populations of patients with chronic disease and enable selective recall of patients who do not meet certain metrics of chronic disease management for more intensive focused care. Using a combination of alerts, clinical decision support, redesigned patient workflows, standing orders, and routine registry searches for population care surveillance, the practice has achieved measurable improvement in both processes of care and patient outcomes for those patients with diabetes mellitus and/or asthma. The following case study details the essential steps taken at WRFP to improve our management of populations of patients with these conditions.

1. Background Knowledge

As an independent ambulatory care practice, White River Family Practice (WRFP) provides primary care to approximately 10,000 residents of Vermont and New Hampshire along the Connecticut River in northern New England. Three area major commercial insurance carriers cover approximately 57% of our patients with an additional 17% on Medicare and 13% on Medicaid. The practice is staffed with six family physicians, three family nurse practitioners (ARNP's), and a support staff of fourteen. WRFP is a teaching site for students of the Geisel School of Medicine at Dartmouth. Our mission is to "provide high quality, state-of-the-art primary medical care to our community of patients with compassion, professionalism, and excellent communication."

2. Local problem being addressed and Intended Improvement

WRFP believes that a patient's current status with respect to guideline-recommended care and chronic disease management should be readily available to that patient's primary care practitioner (PCP) even if that care is ordered or provided elsewhere. This capability increases the efficiency of scheduling patient appointments, is respectful of patients' time and resources, and is more likely to result in more patients being current on recommended care.

As we focused attention on patients with either diabetes or asthma, we recognized a number of deficiencies in our pre-EHR management of these populations. In the paper-record environment, we had been unable to identify those patients who were in need of particular services such as a glycosylated hemoglobin determination (HgbA1c) in diabetic patients or an updated Asthma Action Plan (AAP) for asthmatics. We recognized that some patients had undergone HgbA1c determinations more frequently than recommended while others had not received this determination in many months. In the case of patients with asthma, we could not stratify patients by severity of asthma or degree of control, and we were forwarding guidance regarding asthma management to local schools only when requested by the school nurses.

With a properly configured EHR, we could identify subsets from among populations with these chronic diseases, and we could electronically communicate with patients to notify them of potential gaps in their care or the availability of special services (e.g., seasonal immunizations in high-risk populations). As a clinical microsystem (defined below), WRFP practitioners and staff could employ our EHR to develop techniques to improve the care provided to these populations and subsequently scale-up those techniques to other patient populations both in health maintenance and management of chronic disease.

A Clinical Microsystem has been defined as "a small group of people who work together on a regular basis to provide care to discrete subpopulations of patients" and having "clinical and business aims, linked processes, a shared information environment, and [producing] performance outcomes."(1)

1. (1) Nelson E.C. BPB, Godfrey M.M. Quality By Design: A Microsystems Approach. San Francisco: Jossey-Bass; 2007.

3. Design and Implementation

Assisted by the Vermont Information Technology Leaders (VITL), WRFP identified and installed our integrated EHR system. As we did so, practitioners verified the diagnoses of specific chronic disease for each patient and agreed – to the extent possible – on specific language to be used in patients' problem lists to enable correct identification of these populations in the EHR's registry.

Focusing on our management of diabetes, "Alerts" were configured in the EHR to support real-time notification of indicated care elements for diabetic patients seen in WRFP such that any employee – whether provider or support staff – could offer or provide the recommended care, consistent with established office protocols and standing orders. The EHR's Clinical Decision Support System (CDSS) was fully configured to support standards of care for diabetic patients in accordance with the Standards of Medical Care in Diabetes - 2013. (2) Providers and support staff were taught how to use the CDSS system in the course of an office visit to update patients' care using linked orders and structured data fields. Our Medical Assistant (MA) staff was instructed that a diabetic patient who presented to the office lab for any reason and who lacked a current HgbA1c, fasting low-density lipoprotein (LDL), creatinine, or urine microalbumin determination (as defined in our standing orders) should have these analyses drawn (or ordered) without requiring a specific request by that patient's practitioner.

WRFP formalized "pre-visit preparation," identifying specific care elements to be entered by our MA's in structured fields of the electronic record for a diabetic patient's upcoming visit (e.g., date and result of most recent diabetic foot examination or most recent HgbA1c determination, etc.).

Initially we accepted patients' assertion that certain care had been received from another provider (e.g., diabetic retinal examinations); however, we found this to be unreliable and we have since instituted a requirement that our staff obtain a copy of the outside practitioner's note attesting to completion of the examination. That note is then scanned into the record with an associated structured value (e.g., named "diabetic retinal examination").

With regard to management of asthma, WRFP participated with other Vermont practices in the Vermont Asthma Learning Collaborative, leading to standardized management of all patients with asthma in our practice.

We defined information required for pre-visit preparation for patients with asthma. We specified that MA's obtain peak flow measurements (entered as vital signs in the EHR) when rooming the patient and specified that an Asthma Control Test (ACT) be completed and scanned into the patient's record with an associated structured name at defined intervals. We formalized the completion of an Asthma Action Plan (AAP) for any patient with asthma, to be done when clinical management changes and at least annually.

2. American Diabetes Association: Standards of medical care in diabetes—2013 (Position Statement). Diabetes Care 36 (Suppl. 1):S11–S66, 2013

We initially requested that our EHR vendor electronically integrate the Asthma Action Plan (AAP) available from the National Heart, Lung, and Blood Institute into our EHR; however, because of cost and required development time we ultimately chose to complete a paper facsimile of this form during the asthmatic patient's visit. Once completed, the AAP is provided to the patient together with educational materials and a copy is scanned into the patient's record with an associated structured value (name) for later registry retrieval. In the case of asthmatic children, a copy of the completed AAP is forwarded with parental consent to the appropriate nursing staff at the child's school, day-care, or camp.

4. How was Health IT Utilized?

WRFP's EHR was configured with appropriate alerts and clinical decision supports to facilitate standardized provision of guideline-recommended care for populations with either asthma or diabetes. We defined staff and provider responsibilities for the care of patients in each population in pre-visit planning, in-office care, patient education, laboratory analyses, and e-prescribing for medication management.

WRFP receives daily notification of hospital care provided to our patients (emergency room visits and hospital discharges). Our Medical Records staff creates a "telephone encounter" for each such patient and forwards this to the patient's primary care practitioner. For patients whose hospital contact was related to an exacerbation of asthma, the telephone encounter is forwarded to our Care Coordinator or Triage Nurse who then contacts the patient, assessing clinical status to facilitate a smooth transition of care to the outpatient arena with pre-visit planning and an office visit to assess clinical improvement and update the AAP.

The current status of a diabetic patient with respect to guideline-recommended care is continuously updated as care is ordered or provided, and a practitioner can determine the date and value of that patient's ancillary care or laboratory analyses by referring to the patient's structured data windows in the EHR.

Quality outpatient primary care has typically been assessed by measuring the fraction of patients who receive appropriate services or who are "up to date" with respect to the care element in question. Quality care assessment from patients' perspectives has lagged in development. (3) However, patients' sense of the quality of their healthcare is an important component to a practice's quality assessment, and patients' sense of self confidence in disease management is essential to improving their health. Realizing this, WRFP also provides a link on our website to an Internet-based assessment and reporting tool (HowsYourHealth.org - HYH) that makes improving patients' health confidence central to its reporting functions. Patients are encouraged to use this prior to health maintenance visits and Medicare Wellness Examinations. Our EHR vendor has attempted development of analogous tools within their program, but their use depends on staff or provider input; we believe enabling patients to self-assess from their own homes is more efficient and more likely to result in honest, frank input. Patients are invited to complete the HYH survey in advance of a health maintenance visit, and to securely transmit the results to WRFP. Patients' responses are then scanned into our EHR with an associated structured value (name) to be available to providers at their patients' office visits.

3. Bishop T. Pushing the Outpatient Quality Envelope. JAMA. 2013; 309(13): 1353-1354

5. Value Derived/Outcomes

After WRFP providers and staff were trained and comfortable with EHR use in the provision of patient care, a WRFP physician began routine extraction of population management data from our EHR registry, graphing this data on plots to demonstrate change over time. In constructing these graphs, WRFP makes abundant use of statistical process control (SPC) believing that this methodology is essential to develop an understanding of the causes of any variation in our performance. (4) The graphs are produced using an SPC program (SPCXL, Sigmazone) to depict our average (green line) performance at baseline (2011) and the upper and lower bounds of statistically significant difference in our performance (red lines). Each data point on each graph represents the proportion of eligible patients seen that month that received the indicated care or achieved the indicated care outcome (e.g., HgbA1c). The software electronically identifies significant variation in any one period's performance from the underlying random variation in results (i.e., distinguishing "signal from noise") by calling attention to those points on the developing graph in red font. We can then rapidly confirm whether any recent process change has been beneficial or not, and continue our PDSA cycles of improvement effort.

The following graphs present a mix of process and outcome measures. WRFP posts similar graphic examples of our performance on key population health measures on our practice's website at http://whiteriverfamilypractice.com/.

WRFP recognizes an ultimate goal of improving *outcomes* in chronic disease management, but we also believe the most immediately effective relevant task is to measure and improve our processes of chronic disease management for those patients who are actually seeing us at each visit. Examples of our graphs follow.

4. Carey RG. Improving Healthcare With Control Charts: Basic and Advanced SPC Methods and Case Studies. Milwaukee, Wis:: ASQ Quality Press; 2003.

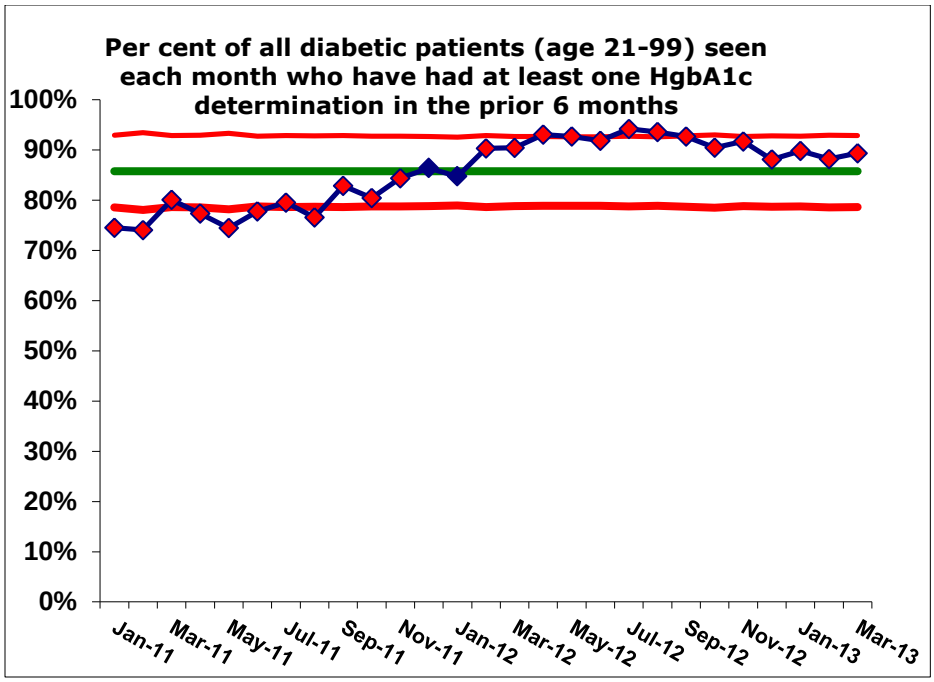

Figure 1: Increasing proportion of diabetic patients who are receiving periodic glycosylated hemoglobin (HgbA1c) determinations.

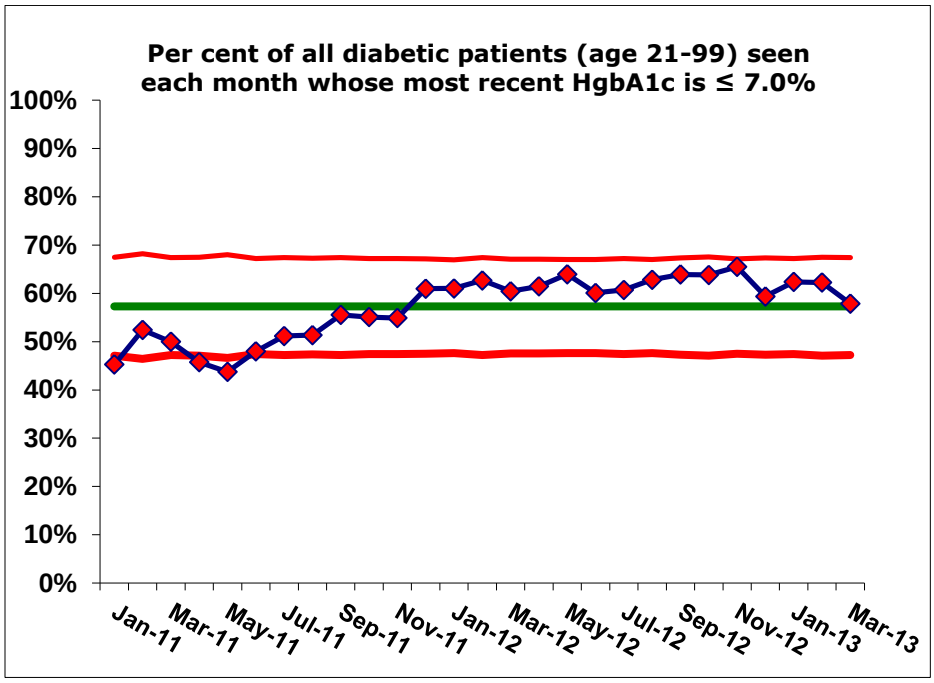

Figure 2: Improving HgbA1c control among WRFP diabetic patients.

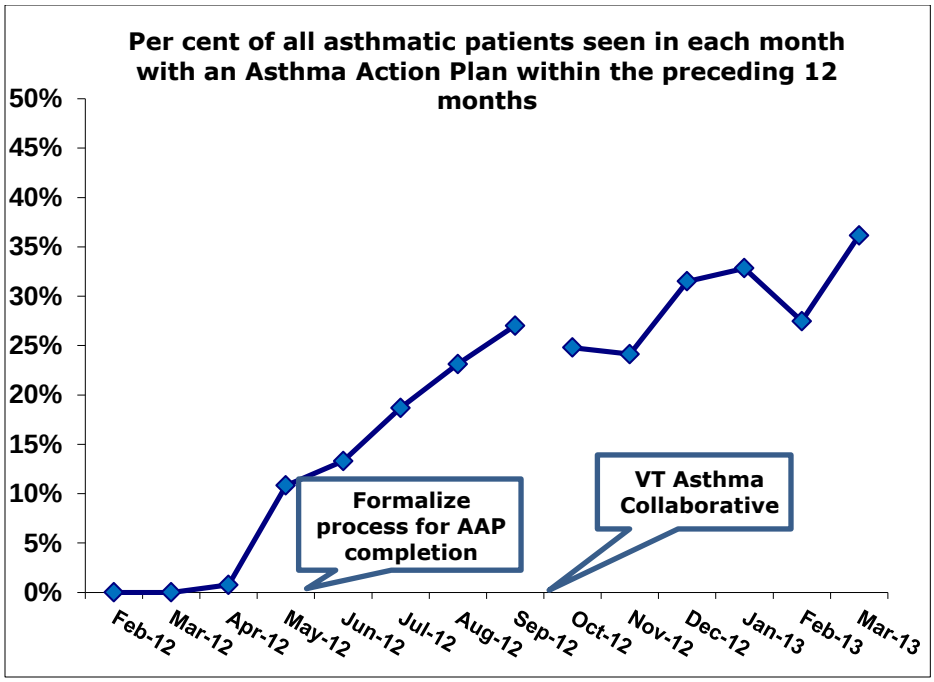

Figure 3: Improving proportion of asthmatic patients with a current Asthma Action Plan (AAP).

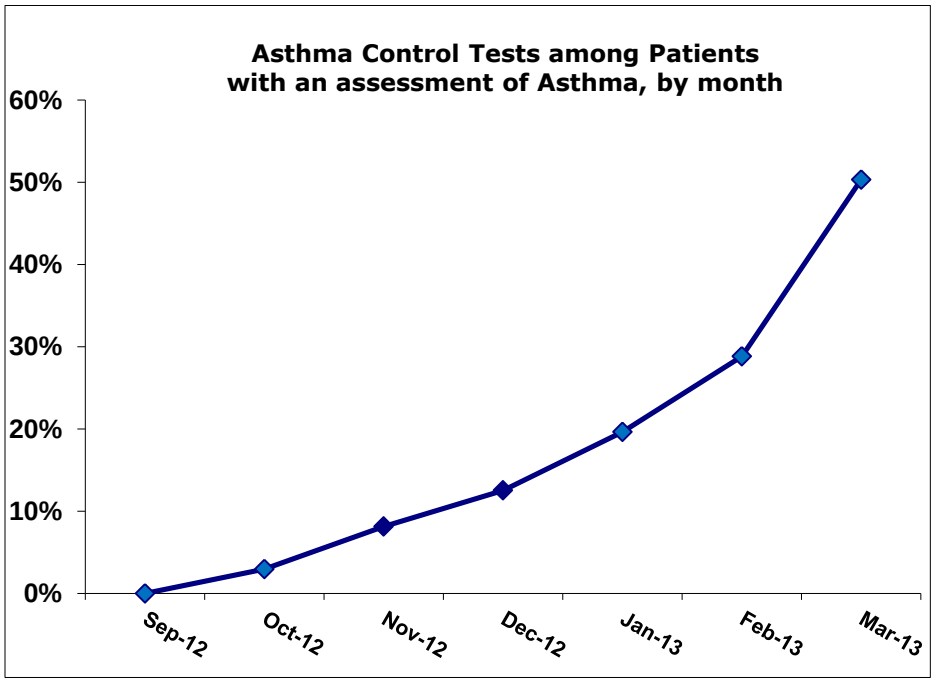

Figure 4: Improving proportion of asthmatic patients with a current Asthma Control Test (ACT).

6. Lessons Learned

- Define the periodicity of laboratory analyses and care elements for the management of your targeted populations. Develop clear standing orders empowering staff to order or obtain any tests or care which are lacking (without a new order from the practitioner). This may require periodic reinforcement to members of your clinical microsystem.

- Define the population(s) of interest. For example, WRFP found an initial challenge in agreeing on the definition of which patients to include as "asthmatic." To date, we have tolerated the exclusion of patients with rare and intermittent "reactive airways" while identifying any patient using an inhaled anti-inflammatory medication as asthmatic.

- Learn to use the registry function of the EHR. Properly configured registry queries will provide the data required for population health management. Likewise, understand the value and use of structured (and therefore searchable) data which is critical for optimal registry use. For example, WRFP considers dilated retinal examinations (DRE's) for diabetic patients to be included in the "bundle" of periodic health maintenance care for diabetic patients. We defined a structured data value as "diabetic retinal examination" and included it among the "Diagnostic Images" portion of our EHR. We can therefore search the EHR's registry for patients who have (or have not) had a current DRE. Defining a second structured data value to be the name of a patient's eye-care provider enables us to search for all diabetic patients who receive eye-care from a particular practice. WRFP can then communicate with that particular office regarding all WRFP patients receiving care there to improve our coordination of care for our diabetic patient population.

- Sharing clinical information electronically (with appropriate patient consent) across institutions (e.g., to hospitals or among other practitioners involved in caring for the patient) is a persistent challenge as medical professionals increasingly depend on information technology to deliver high quality, safe, effective, and efficient care. In our region, VITL has established a secure electronic link ("VITLdirect") which allows participating providers to communicate and share clinical data and records. Using this link, WRFP now receives reports of completed retinal examinations from the optometrist's office from which a substantial number of our diabetic patients receive their care. A WRFP staff position downloads, scans, and electronically forwards the retinal examination report to the patient's PCP as structured information.

- Your EHR registry should allow specific metrics of interest to be customized. In our case, the embedded quality registry identifies diabetic patients whose blood pressure is not below 130/80 whereas the current Standards of Medical Care in Diabetes - 2013 recommends accepting a systolic blood pressure of < 140 mmHg in some patients. (5) WRFP and others using this system have provided feedback on this point to the vendor. Practices considering this EHR as a platform on which to optimally manage populations in accordance with evolving standards of care should consider requesting that the vendor develop the ability to customize registry parameters within the system.

(5) American Diabetes Association: Standards of medical care in diabetes—2013

7. Financial Considerations

WRFP was fortunate to receive $140,000 in grant funding from VITL toward the acquisition of our EHR. WRFP used a further $70,000 line of credit (repaid within the first year of EHR operation) to finance our transition so that implementation costs above those supported by the grant would not adversely affect operations. Beyond the initial funding of our EHR, subsequent licensing and support fees as well as workstation replacements have been funded through income from operations.

Non-reimbursed expenditures have included physician and staff time to participate in the Vermont Asthma Collaborative, meeting time to plan new patient-care work flows, and the time required to develop the databases from which our performance improvement graphs have been drawn. WRFP has found that our improvement in population management would be difficult or impossible without the "after-hours" work of some individuals, and the willing support of the rest of the office to follow their lead.

However, our success in EHR implementation and our demonstrated improvement on population measures has enabled WRFP to successfully attest to Meaningful Use in years 1 & 2, allowing WRFP to optimize incentive payments under this CMS program. In addition, the Vermont Blueprint for Health provides incentive funding proportional to the number of Vermont residents receiving care and to an office's Patient Centered Medical Home (PCMH) certification score. WRFP was able to achieve a very high score (93 out of a possible 100 on the 2011 NCQA Guidelines) as the practice successfully certified as a Level III PCMH with focus on these two diagnoses as examples of improving chronic disease management, thus providing additional funding from operations.