PROJECT VULCAN

VULCAN MEDICAL CLINIC

"INNOVATIVE EMR PROJECT"

Submitted by:

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EXECUTIVE SUMMARY

Prior to 2013, the Vulcan Medical Clinic went from having 4 full-time physicians to 1.25 FTE. Only one of the remaining physicians was taking call one night per week. Locums were being brought in to cover shifts in the clinic and the emergency department. There was an ever increasing concern about the continuity of care patients were receiving in our clinic.

The obvious solution to the evolving crisis at the Vulcan Medical Clinic was to find more family physicians willing to relocate and establish their medical practice in Vulcan. However, finding physicians qualified and willing to work in Vulcan is not an easy task. In spite of our ongoing, multilevel recruitment efforts, it will take years to rebuild a full complement of family physicians working in our clinic. Patients couldn't wait. Something had to be done right away to ensure all patients residing in Vulcan County would have access to the best quality of health care possible.

In 2013, a small team lead by Dr. Shawn Webster and Suzie Mitchell (RN), decided that they could improve the continuity of patient care by making small changes to the physical structure of the medical clinic, by increasing the roles and responsibilities of two of the Medical Office Assistants working in the clinic, by cleaning up and clearly identifying the patients in the clinic's panel, and by implementing major changes to the way that they used the Wolf Electronic Medical Record system already installed on some of the computers in the clinic.

These changes have:

- increased a physician's "patient time" dramatically;
- allowed all physicians to find patient information in an efficient and timely fashion;
- improved the continuity of care patients are receiving in spite of having numerous locums involved;
- increased the number of patients receiving screening for disorders such as hypertension, colon cancer, and diabetes; and
- improved the medication reconciliation process.

We recognize there are other clinics in Alberta that have or are currently working on adding "Rules" to their EMR systems. What sets the Vulcan Medical Clinic apart is the fact that we introduced and tested these Rules simultaneously. Physicians and staff we consulted in other areas advised us that we should implement these changes slowly. We were told the Rules should be introduced and tested "one at a time" before applying it on a clinic wide basis. However, we couldn't wait! If this was going to help our patients now, then all of these Rules had to be implemented within a six-month period. The success of our project is the result of the amazing work of our small team of dedicated professionals.

HISTORICAL PERSPECTIVE – PRIOR TO 2013

VULCAN COMMUNITY HEALTH CENTRE

The Town of Vulcan is a small, rural farming community located in Vulcan County in Southern Alberta. Covering an area of 546 772 hectares (2 400 sq. miles), the County of Vulcan encompasses the Town of Vulcan, five villages, eight hamlets, and numerous colonies of Hutterian Brethren. The combined population of Vulcan County is approximately 6 900 people but these numbers swell to over 10 000 people during the summer months as there are several seasonal resorts located in this area of the province.

The Vulcan Community Health Centre is a multipurpose facility. This centre has both long-term (17) and acute care (8) beds and is running at a 95% to 110% capacity. The physician's medical clinic, X-Ray department, laboratory services, physiotherapy, community health department, and a five bed emergency department, are also located in the health centre. One physician is required to be 'on-call' 24 hours per day – 7 days a week in order to keep all of these facilities open. The medical clinic handles an average of 80 patients per day if there are four doctors available. This number decreases to approximately 60 patients per day if only three physicians are working in the clinic. The clinic normally has one physician designated as the "on-call" doctor. This physician treats walk-in patients as well as any patients requiring urgent care in the ER.

DOCTOR SITUATION AND CONCERNS

Until recently, the Vulcan Community Health Centre and Medical Clinic were served by the equivalent of four-full time physicians. Early in 2013, two full-time physicians advised they would be leaving their practice in Vulcan. Instead of having four to five full time equivalent physicians to handle the work load, the health centre and clinic was left with three part-time physicians working the equivalent of 1.25 FTE. Only one of the remaining physicians took "call" one week night per week. All remaining shifts in the clinic as well as the on-call shifts for both the hospital and the ER were covered by locum physicians.

Many patients no longer had access to a regular family physician or, if they wished to see their regular physician, had to book an appointment many weeks in advance. Having limited access to a regular family physician coupled with the increased use of locum physicians, created an every-increasing concern for:

- the continuity of care our patients were receiving;
- the increased chance that a patient would not receive proper or timely follow up from a physician;
- potential communication breakdowns between the health care professionals and their patients and/or families;
- the possibility a patient would not be advised of available screening or preventative health measures; and

As well, it was observed that some locums have limited or no knowledge of the Wolf EMR system. For example, some the locums could not figure out to use the EMR to generate a prescription request for a patient. These physicians would, instead, hand-write the prescription for patients and we could not confirm that this information was properly entered into the patient's file.

Physical Space in the Clinic Itself

The physical set up of the clinic was a choking point for the flow of patients through the clinic. For example, upon arrival, patients were seen by a medical office assistant (MOA) in a central, semi-private room in the clinic. Basic vital information on the patient including height, weight, blood pressure, waist circumference, and temperature were taken by the MOA and keyed into the patient's file. The patient would often be asked a few personal questions before being taken to one of the examining rooms in the clinic. The problems associated with this procedure were three fold:

- Even if there were two or three assistants available, only one patient could be interviewed at a time which limited the number of patients the clinic could handle during the day.
- There was very little privacy for the patient. At any given time, there could be two or three MOA's in this room, one of the other clinic staff could be passing through this area, and other patients would be walking by the open doors of this area on their way out of the clinic. This lack of privacy was preventing many patients from disclosing vital information to the MOA.
- The MOAs had access to only one computer. This slowed down the process as they could only deal with one patient at a time.

Electronic Medical Records Underutilization

The Wolf EMR software was installed in the Vulcan Medical Clinic in 2004. This software was "underutilized." The Wolf EMR software was primarily used by the physicians:

- to record information gathered during a patient's clinical visit;
- to record patient medication information;
- to review scanned documentation; and
- to access a patient's referral documentation.

The MOAs and other staff members had limited access to the Wolf system. This left the physicians responsible for entering the majority of the information into the EMR. Inputting basic patient information into a patient's file was an incredible waste of a physician's time, energy, and training.

The physicians as well as the clinic-staff were not maximizing the Wolf EMR's capabilities with respect to medical requisitions. Each requisition was printed out, filled in by the attending physician (by hand), and then scanned by an office assistant before being uploaded into a patient's file. Every requisition had to be handled at least four times before the patient left the clinic.

The Wolf EMR system is a very powerful database. However, the few "Rules" (pre-built flags) that shipped with the original software package were considered, by the physicians, to be "unreliable" at best. The few protocols and search parameters built into the software limited the usefulness of this database. Patient data may have been in the EMR but the lack of protocols, no standardization of the terminology or keywords used, and the inconsistent filing system used by the physicians made it nearly impossible to locate information in a timely fashion. The retrieval of information was time consuming and frustrating for the physicians.

PATIENT PANEL

Our catchment area includes much of Vulcan County. Our patient panel includes all individuals who had been seen by a physician at the Vulcan Clinic since the Wolf EMR system was adopted in 2004. If a chart had been created for the individual, they were automatically added to the patient panel.

In 2013, our patient panel was in excess of 16 000 individuals. We had no idea who our true patient panel included, and, in many cases, which physician was identified as the patient's primary physician.

CHANGES IMPLEMENTED IN 2013 – 2014

It was clear that we had to take a team approach to support our physicians (regular and locums) and to ensure the continuity and quality of health care provided to our patients.

Our team included:

- Dr. Shawn Webster – M.D., C.C.F.P, Vulcan Medical Clinic
- Bridget Mueller – Business Coordinator, Vulcan Medical Clinic
- Suzie Mitchell (PCN, RN) – POET, Panel Manager, Vulcan Medical Clinic (0.5FTE)
- Louise Dodds (RN) - Anticoagulant/Complex Care/Data Management Nurse (0.5 FTE)
- 2 regular Medical Office Assistants and 1 casual assistant
    - Lisa Bexte - full time Medical Office Assistant
    - Jantina Herrick - full time Medical Office Assistant
    - Sherry Koszta - part time Medical Office Assistant
- Amanda Kaselkat - the clinic's Receptionist and Scanning Document Management
- Cicely Campbell - the clinic's Patient Navigator

PRIORITIES

Our team established four priorities:

- to make the physical changes to the clinic necessary to improve patient flow,
- to expand the roles and responsibilities of the MOAs and other staff members working in the clinic;
- to clearly define the patient panel at the clinic; and
- to maximize the capabilities built into the Wolf EMR database.

Although many of the strategies were adopted and implemented simultaneously, they will be listed in terms of meeting these priorities.

PHYSICAL CHANGES TO THE CLINIC

The following physical changes were made to the clinic itself.

- All eight patient examining rooms in the clinic were equipped with a dedicated telephone, computer, and printer that the MOAs could access.
- Each examination room was also equipped with a weigh scale, measuring tape for height, and a bPtru – electronic blood pressure monitor.
- Instead of going to a central, semi-private common area, patients are accompanied by an MOA to one of the examination rooms.
- The common area was transformed into a MOA office with four work stations.
- The central physician room was also upgraded and equipped with four computers
- Patients now begin their clinic visit in complete privacy.

INCREASED ROLES AND RESPONSIBILITIES OF THE MOAS AND CLINIC STAFF

The Medical Office Assistants have received specific training enabling them to:

- take the patient's blood pressure, height, weight, waist circumference, and other vital signs;
- access the individual's file from this computer and input this information directly into the patient's chart;
- check the patient's "Rule" list and complete requisitions for lab tests, book appointments as needed as part of a "Patient's Screening Rules" (See pages 9 and 10 for a complete description and examples of these Rules)
- input test requisitions enabling us to track patient compliance and to assess our process if we are concerned about the frequency of "declining;"

- can add notes to the "Plan" field in a patient's chart including anything related to the Rules that are established for the patient, screening appointments, or other patient concerns;
- clinic staff, including an onsite RN, interview all new patients before a physician sees this patient. The staff, not the physician, enter:
    - all of the patient's personal information;
    - medical history (allergies, immunizations, existing diagnosis, etc.)and family history;
    - the patient's and/or family's consent forms where appropriate;
    - book initial appointments and provide requisitions for screening; and
    - designate all new patients as "Vulcan Clinic" patients; this will change as additional regular physicians are recruited
- The "Patient Navigator" in the clinic:
    - handles all patient referrals to specialists;
    - does all of communication with other physicians and health care professionals;
    - deals with all of the incoming, electronic documents ;
    - books all tests and procedures for patients; and
    - contacts the patient advising them of booking times, locations, and other pertinent information.

CLEANING UP OUR PATIENT PANEL

To clean up our patient panel we needed to attempt to identify which of the 16 000 individuals in our current patient panel were still being seen by physicians in the clinic. This was accomplished by:

- conducting searches based on the last time the patient was seen by a physician at the clinic;
- studying each patient's demographics to see if they were still living in the area;
- cross-referencing *Netcare* to look for patients still in our panel who were using physicians in other locations i.e., by tests ordered/results and prescriptions issued
- personally contacting patients who were comfortable seeing any physician in the clinic and asking these individuals to identify a primary physician if at all possible;

- creating patient "status" criteria to tag each individual in the pre-2013 patient panel
    - out of jurisdiction
    - no longer living in the community
    - deceased
    - hospital patient only
    - long-term care patient
    - physician left practice
    - current patient with identified provider (doctor) designated
    - a patient, living in the jurisdiction but without an identified provider, was designated as "Vulcan Clinic" patient; this enables us able to provide reliable information on the number of patients that can be assigned new physicians.

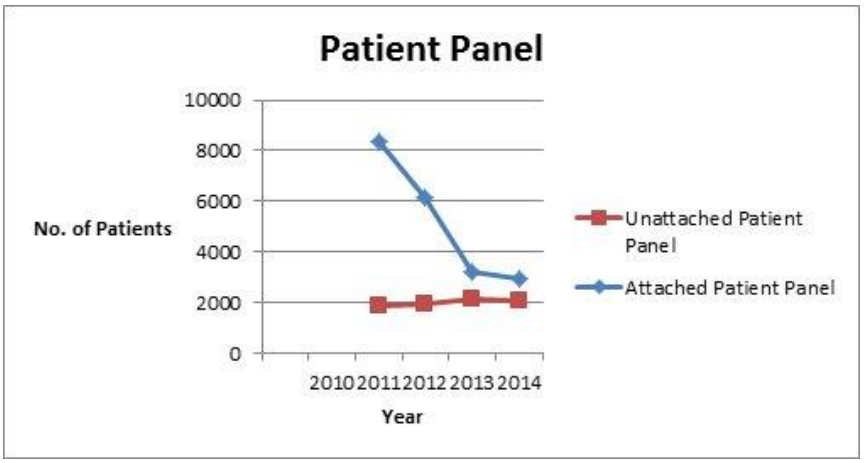

Figure 1: Patient Panel

This graphs shows we have been able to reduce the actual number of attached patients in our panel to approximately 3 000 patients. The unattached patient panel remains at approximately 2000 patients.

One of the benefits of cleaning up our patient panel is we can generate reliable information on the demographics of our patient panel including the Age Breakdown of our panel (see Figure 2 on page 10 of this document). This type of information will be useful as we can easily determine how many patients would fall into in an age-specific screening program.

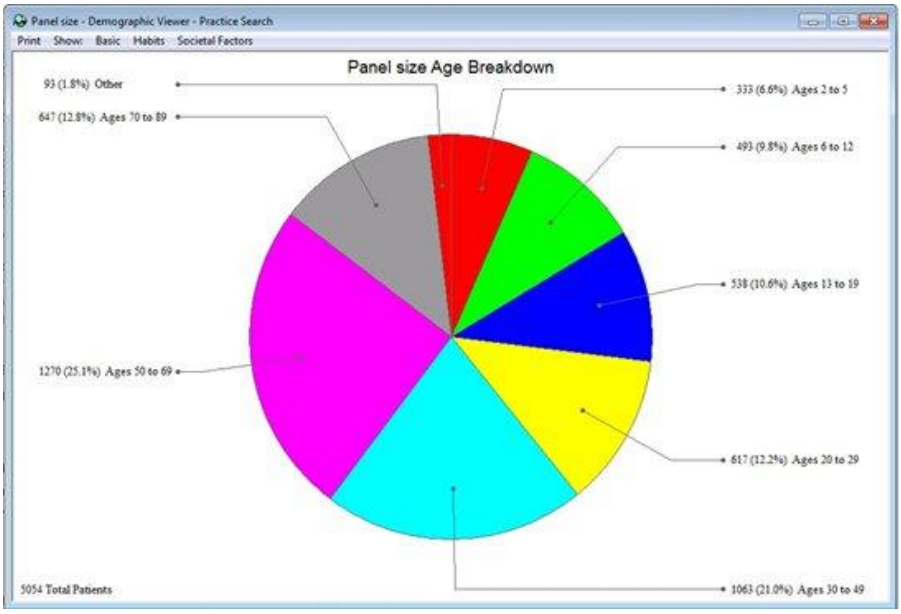

Figure 2: Panel Size – Age Breakdown

UPDATING THE PANEL IMPROVED PATIENT APPOINTMENT BOOKINGS

Once we had cleaned up our patient panel we discovered a problem with our patient booking system. Although most patients preferred to see a regular family physician, they were frustrated with the fact that they would have to make the appointment several weeks in advance. Rather than waiting to see their designated physician, they would book an appointment with any physician who had an opening in their schedule.

We looked at each chart to establish which physician the patient had seen most often or the physician who was responsible for booking the most lab tests or writing the most prescriptions for that individual. If we confirmed multiple physician involvement, we

- discussed the patient with the physicians to see if there was a medical reason for the multiple physicians;
- we contacted the patients to discuss the benefits of having a primary physician and asked them to identify the physician of their choice; and
- once the patient's preference was confirmed, we arranged for their charts to be transferred, if required, and we updated the patient's New Status or Primary Provider information fields in their EMR file.

This, by itself, did not improve a patient's wait time to see their regular physician. However, what it did do, was allow us to open 25% of our regular physician's schedule to "same day access." Having 25% of the physician's day open for their regular patients to access, has certainly helped us meet our goal of continuity of patient care.

MAXIMIZING THE USE OF THE WOLF EMR

Although most of the staff had used a database in the past, learning what databases actually did, how they worked, and the importance of standardizing the way information was entered into the database was new to us. We could see that, although information was entered into our EMR, it was often entered in different fields, in different formats, and the terminology used was not consistent. For example, a colonoscopy result in the system was called a *consult*; *Dr. Result*; and a *DI*. It was a classic example of "garbage in – garbage out!" We quickly determined that we couldn't maximize the potential of the Wolf EMR unless we learned more about database management and we were clear what we wanted this software to do.

Suzie Mitchell (RN) was the lead person in this process and put in a tremendous amount of time to make this happen. These are the steps Suzie undertook:

- attended a number of training sessions to learn how Wolf EMR database system worked and the steps required to make this a user-friendly system that provided reliable information in a quick and efficient manner;
- worked with Dr. Webster and the clinic staff to develop the standardized terminology (Keywords) critical to document utilization;
- before documents could be searched reliably, she had to find documents already in our Wolf EMR and then rename each document based on the standardized Keywords;
- worked through EMR Patient "Problem Lists" to ensure all diagnoses were current and correct;
- confirmed that the diagnosis criteria for each Patient Problem was entered into the system and that test requisitions for follow up were automatically generated i.e., PFTs for COPD patients;
- created digital medical requisitions or "SMART" forms that auto-populate most of the data fields. The Physician simply adds the specifics to the form and prints it out for the patient; the form is automatically stored in the Documents Field in the patient's file;
- based on best practice guidelines, searchable protocols called "Rules" were created for patient screening. For example, Rules were created for ;
    - Advance Care Planning
    - Annual Blood Pressure Measurement
    - BMD Screening
    - BMI measurements
    - Cardiovascular Risk Profile
    - Chronic Kidney Disease Staging-(encompasses 15 individual Rules)
    - Colon Cancer Screening
    - Complex Care Planning
    - COPD patient for PFTs

- COPD patients-require 'Action Plans'
- Diabetic Monitoring-labs and Opthalmology exams
- Diabetic-Prediabetic monitoring
- Diabetic Questionnaire for Risk
- Hypertensive Patients due for baseline EKGs
- Hypertensive Patients Blood Pressure Monitoring
- Hypertensive Patients for lab monitoring
- Lipid Profile for Routine Screening
- Mammogram Screening
- PAP Screening
- Proteinuria Monitoring
- Tobacco Screening
- Medication Reconciliation (undergoing testing at the current time)

- established a set of "Medication Monitoring Rules" for the following medications where labs, X-Ray, and/or consultations with their regular physicians are required. These medications include:

    - Amiodarone
    - ARB/ACE
    - Digoxin
    - Diuretics
    - Insulin
    - Lithium
    - Metformin
    - Methotrexate
    - Plaquenil
    - Statins
    - Synthroid
    - Warfarin

- as each Rule was activated in the system, it was first tested by Dr. Webster to make sure it was accurate and reliable before it was made available to the other physicians in the clinic;

    - For example, Suzie and Dr. Webster are currently testing a Medication Reconciliation Rules. These Rules will ensure that all physicians working in the clinic are aware of the patient's medications and dosages, including if the patient's medications have been changed and why. This information can now be communicated to the patient, family member, and/or the patient's primary care giver in the community.

    - Once these Rules have been tested and approved by Dr. Webster, they will be made available to other physicians working in the clinic.

- the Rule(s) can be changed quickly and efficiently should new information become available or if certain guidelines are changed;

- refined the "Keywords" in documents and revised rules as anomalies appeared. For example, a searchable parameter was added to quantify patients that have been "offered" a screening program but have "declined" to participate in the program. This attending physician can easily see that the patient has declined this program and can engage the patient in a deeper conversation about the benefits of early detection of specific diseases or disorders;

- initiated an active 'call-back' process for Chronic Disease patients and routine screening i.e., PAP, COPD, DM, HTN, Colon Cancer. Call back lists are generated using specific "search criteria" that we have built into the EMR. Currently we have 102 search criteria that we can use to find patients in our systems in an efficient fashion. Instead of having to look up each patient individually, we can input one or more search criteria into the EMR and all patients meeting these criteria are pulled up on the screen;

- we are currently working with the RNs in the adjoining hospital to develop a consistent flow of patient information from the hospital to the clinic;

- initiated frequent meetings with Dr, Webster, the Clinic's Office Manager and other clinic staff to review new processes and brainstorm new ideas or address problems; and

- provided education and rationale to all physicians and staff to establish buy-in and engage them as part of the Team.

EXAMPLE: IMPLEMENTATION OF COLON CANCER SCREENING PROGRAM

Below are the steps taken to develop a Colon Cancer Screening program based on the work we did within the Wolf EMR and with the Medical Office Assistants. This example assumes that the Patient Panel had been "cleaned up" and that the MOAs had received the training required.

1. Determined the Keyword(s) for the standardized labeling of all documentation related to colon cancer screening.

2. Manually searched the EMR to locate mislabelled documents and then renamed them based on the designated Keyword(s)

2. Developed "Colon Cancer Screening Rule(s) which was entered into the EMR system.

3. Activated this Rule for the lead physician to tests with his patients.

4. When a patient arrives for routine appointment, the MOA will open the patient's EMR file. The MOA will see the Rule(s) for this patient and then identify tests/procedures associated with this rule. The MOA can, with the click of a button, create the required requisition form and hand the supplies to the patient if a take home test kit is required.

5. If the patient raises additional questions, the MOA can input these into the patient's file. The doctor can address these questions or provide the patient with more information especially if the patient has refused the screening test.

6. During the trial period, the documents, keywords, and rules were reworked making sure that everything was working and that critical pieces of information were not being overlooked. For example, we discovered a 'Manual Result' field had to be added to track patients who wish to 'Postpone or Decline or Refuse' the suggested screening test. Other patients would agree to self-book tests, which we then identified as 'Offered' in order to monitor number of patients following through and we could demonstrate MOA efforts within the process.

7. When +FIT/FOB results arrive back, the clinic RN followed-up by personally contacting the patient for initial teaching to discuss what the patient can expect when having a colonoscopy, who will contact them, identify a location where the colonoscopy can be done, and answer any questions that the patient may have about this procedure.

8. The +FIT/FOB result is then forwarded, via Message within EMR, from clinic RN to Patient Navigator who, in turn, sets up a Referral for urgent colonoscopy booking within the 30 to 60day guideline.

9. The results of a colonoscopy report arrive back at the clinic, a message is sent to the clinic RN who creates, based on the pathology, "Follow-up Reminders" in the patient's EMR. These reminders automatically show up in the Patient Navigator area of the EMR notifying the navigator 6 months in advance if a follow-up colonoscopy is required in the future. Note: these are for patient who may require colonoscopy prior to the routine 10 year test cycle.

10. The patient will be contacted at the time the 'Follow-Up' for Colonoscopy, notice appears in the EMR. The Patient Navigator or RN will call the patient to let them know they are due for a colonoscopy and to expect a call from that site in the near future. They are advised to call the clinic back if they have not heard from that facility in a reasonable time period.

11. If the Patient's colonoscopy results come back "Normal" and the routine follow up colonoscopy is recommended, then the 'Rule' that will capture that information will show up in the EMR as a colonoscopy required every 10 years per guidelines.

12. During our ongoing Panel Clean up, we reviewed any previously received Colonoscopy reports/pathology results for recommendations to create 'Follow-Up' reminders in the Documents area of the patient's EMR. This process created a 'safety net' for any tests that were previously left up to the physician to 'find' when scanning a patient's file.

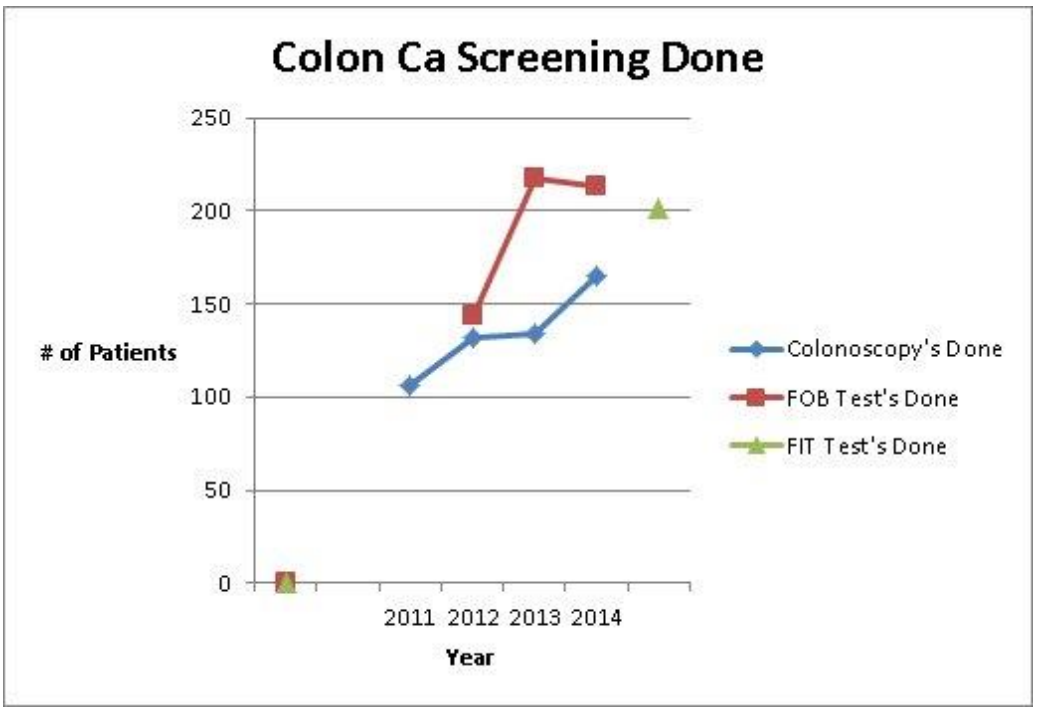

Figure 3: Number of patients involved in colon cancer screening has increased since we have implemented the changes to our EMR system

EXAMPLES OF SCREENING RULES APPLIED TO OUR EMR

Our EMR innovation team recognized that the ideal way to approach the changes we wanted to implement was to work on one Screening Rule at a time. However, our team also recognized that we did not have the luxury of time. Our clinic had lost two full-time physicians, we were using an inordinate number of locums, and our patients simply couldn't wait for us to take a slow and steady approach. Instead, we introduced multiple rules simultaneously, had our lead physician test and evaluate each rule, and then trained our MOAs accordingly. The following are examples of the Rules that we currently use in our clinic.

OBESITY

- When the MOA first calls up a patient's EMR file, a "Measurement Screen Rule" appears. The MOA measures the person's height and weight and enters that information into patient's file.

- That information can be used to determine the individuals Body Mass Index (BMI).

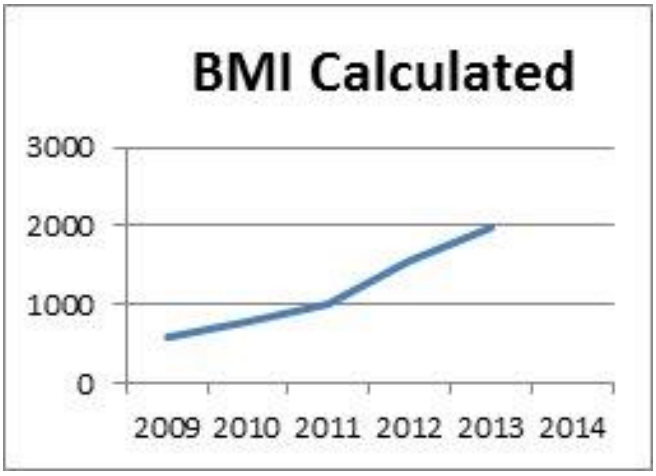

Figure 4: T number of patients who have had their BMI calculated.

- The number of patients receiving this screen test is as a direct result of this Rule appearing in their EMR.

DIABETIC SCREENING

- We have implemented criteria for screening in the "Rules" to trigger routine A1C/FBS and with increased frequency for pre-diabetic patients.

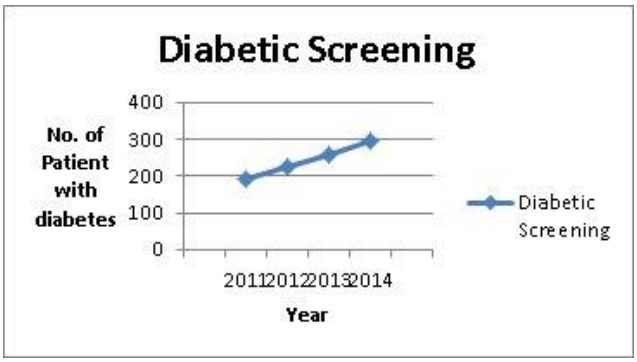

Figure 5: This graph shows the total number of patients diagnosed with diabetes.

- The number of patients with diabetes has increased as a result of this Rule being used in the EMR and more pre-diabetic patients being screened.

PAP TESTS

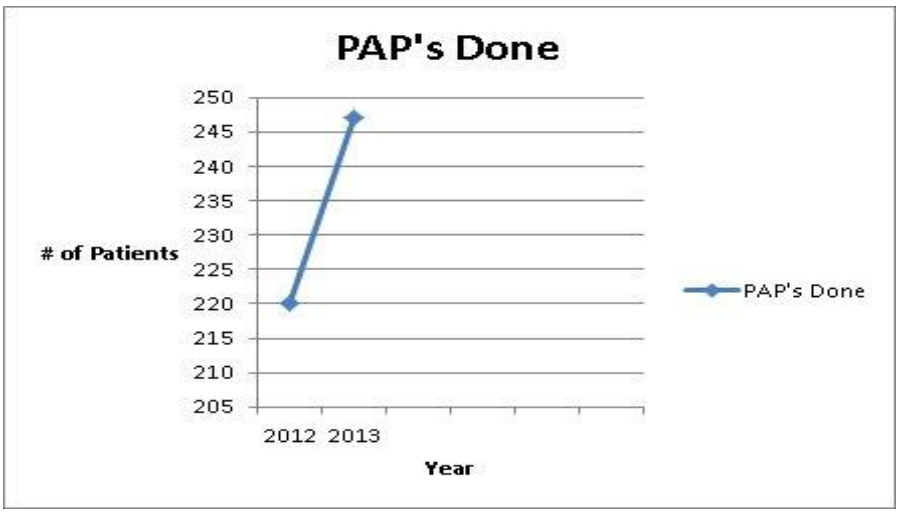

Figure 6: PAP Tests done in 2012 - 2013

- The higher than expected number of PAP's conducted before the implementation of this Rule into our EMR, was the direct result of a "Pap Blitz" implemented by our two female physicians Dr. Hudson and Dr. Gausvik, as well as our NP Lynn Hill. At the end of 2011, the guidelines were readdressed and there was a reallocation/trial involving our NP accepting 'walk-in' appointments. This change was necessitated by the fact that neither Dr. Hudson nor Dr. Gausvik were working full-time at our clinic. The PAP screening Rule introduced in our EMR system now notifies our MOA's when patient is due for a regular PAP-test. The MOA prints out the requisition form and hands it to the patient before the physician enters the examination room.

TOBACCO USE

- Prior to 2013, we couldn't easily determine the number of patients 12 years of age and older using tobacco products. We also couldn't track them to see if there were any trends in the data.
- Now, our MOA staff can update a patient's chart by simply asking them about their use of tobacco products. This information also triggers another Rule whereby these patients are now asked about their tobacco use annually.
- Tobacco Addiction information is then updated in the patient "Problem List" or Dx list by RN's. This regularly updated information can now be used populate the patient's Complex Care Plan.

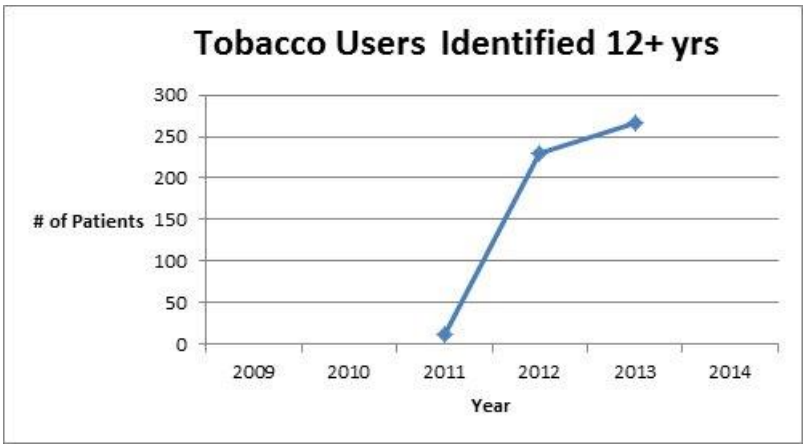

Figure 7: This graph shows an increase in the number of patients identified as using some form of tobacco. The trend may indicate an increase in the number of actual users of tobacco but it may also be a factor of having more up-to-date and more reliable data in the EMR.

HYPERTENSIVE PATIENTS

- Since 2013, we have made improvements to the examining rooms including the addition of sensitive electronic sphygmomanometers. These new devices are accurate and do not require the MOA to use a stethoscope to determine a patient's blood pressure. Instead of having one blood pressure station, every examination room in the clinic is equipped with the electronic sphygmomanometers. This, along with the new patient handling model discussed earlier, allows us to screen far more patients for hypertension.

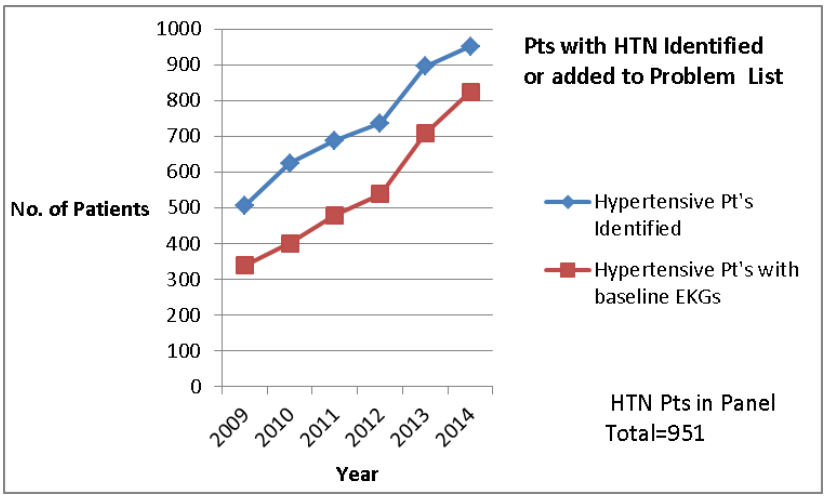

Figure 8: Patients with diagnosed HTN

- As the graph above shows, our panel of hypertensive patients has increased. The increase is a direct result of our increased screening efforts using Rules for increased Blood Pressure. The increase in hypertensive patient panel is also the result of the work we did within the pre-2013 EMR to update all patient files – we were able to catch a number of patients that may otherwise have been missed.

- We can now ensure "Hypertension" is now clearly identified in a patient's Problem List.

- Adding hypertension to the Problem List allows us to populate the patient's Complex Care Plan with this information

- We have also focused on getting all patients with HTN to have baseline EKGs on their Health Record. This record can be accessed by our ER Doctors 24/7.

- We now have 88% of our Hypertensive patients with a Baseline EKG on their chart. During the screening process, some patients discovered cardiac issues and went on to have Stress Tests leading to further diagnosis. Some patients became actively involved in Life Style Changes resulting in the evidence found in the routine EKG.

OTHER PROVINCIAL SCREENING IMPROVEMENTS OBSERVED

- We believe the process changes we have made in our EMR system has increased our ability to get more patients into screening programs and have identified more problems earlier as a result of this additional screening.
- We began with Blood Pressure Monitoring, BMI, PAP, Mammograms, Colon Cancer Screening and BMDs, all in accordance with the Best Practice Guidelines.
- The following graphs show an overall increase in just a few of screening programs we have implemented to date.

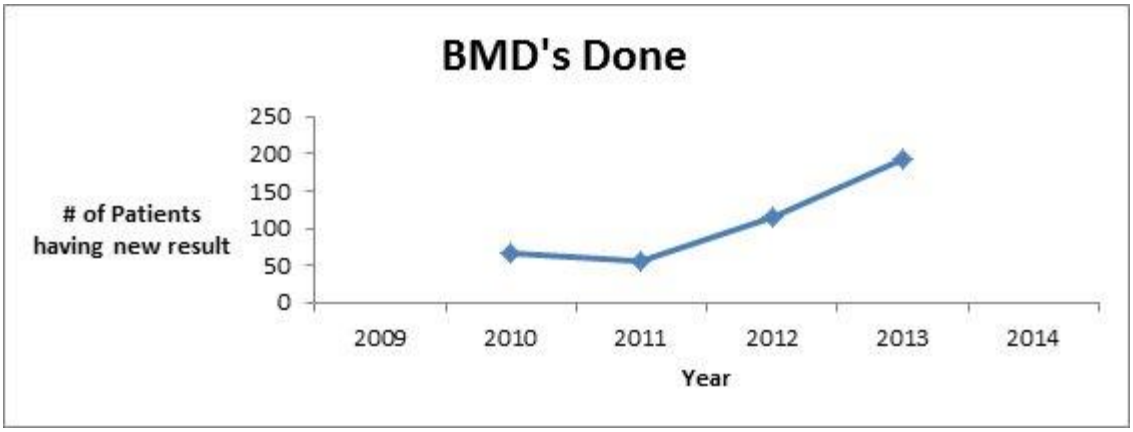

Figure 9: Number of patients with new results as a result of regular screening.

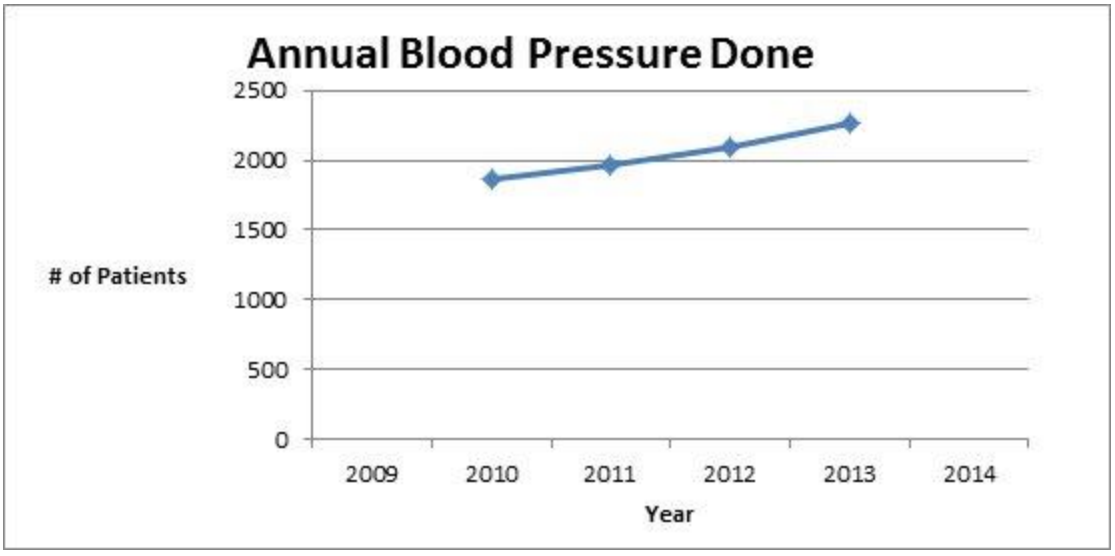

Figure 10: Number of patients with an increased BP within a one year time period.

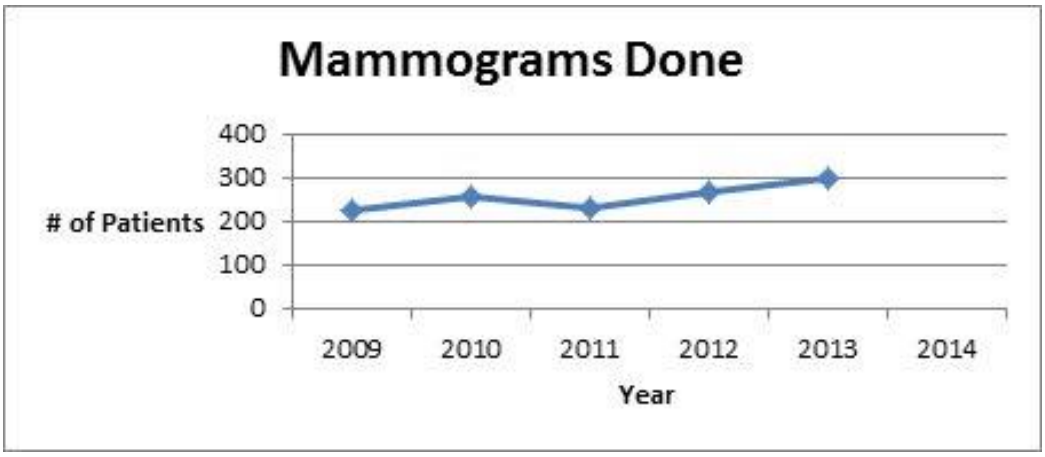

Figure 11: Number of patients being screened for breast cancer.

RESULTS OF THE VULCAN MEDICAL CLINIC EMR INNOVATIVE PROJECT

OUR PATIENT BENEFITS

- Rigorous work to the 2004 patient database allowed us to update and create accurate patient panels which, in turn, allowed us to define patient populations.
- As our Screening Rules became more accurate, we were able to identify patients seen only in the clinic as opposed to those seen in the ER and the acute care department of the hospital.
- We can use the accumulated data for recall purposes
- The data can be used for future program plan development and for clinic goal setting purposes.
- Even though a patient may not be able to see the same physician each time, there is improved continuity of care provided to the patient.
- Communication between a patient and all health care professionals involved in their care has been improved. Communication between a patient's family and the health care system has also been improved.
- A physician can see all of the patient's information at one time without having to look through multiple forms and letters. This will reduce the chances of something being missed because the information was not readily apparent to the physician.
- The EMR 'Rules' clearly identifies all tests and procedures that have to be performed at time sensitive intervals.
- Patients can be tracked to inform them of medication changes, and to advise them of the need to get additional tests/procedures performed when taking medications.
- Patients are more likely to be screened for pre-existing conditions such as diabetes, COPD, obesity, hypertension, and cancer.
- The patient is treated in a more "holistic fashion".
- Access to diabetic care, respiratory therapy, chronic disease management, and women's health, to name only a few services, can be obtained without a doctor's referral.
- The RNs receive information on any regular patient who has recently been discharged from the hospital. The RNs contact these patients to ensure that they are following their recovery plan which, in turn, will help to keep these patients from having to go back to the hospital for further treatment.

Our Physicians Benefit

- Physician "patient time" increased 25% with this system in place. They are not solely responsible for inputting information into a patient's file and the information in the system is easy to find.

- Patient files are updated with documents received from ER visits, hospitalizations, mailed/FAXED test results received from off-site specialists, pharmacy extension/refills, etc.

- Emergency personnel, including the on-call doctor, have access to this same EMR 24hrs/day.

- Medication information is kept up to date by the clinic RN. The RN adds information when new documents arrive and when medication change documentation is confirmed. This is a benefit to both the physician and the patient.

- Social factors and family histories are included in a patient's file. This is especially important as Locum physicians may see a patient only one time.

- The standardization of terminology used, location of where information is recorded, and the establishment of Screening and Medication Rules, allow the physician to search and find patient information in a reliable, efficient manner.

Anecdotal Comments from our Physicians and a Locum

Dr. Leonard Wade – M.D., C.C.F.P, Chief of Staff for the Vulcan Community Health Centre, Deputy Chief for the Department of Rural Medicine – Calgary Zone

- *When you see patients because of existing problems, it is easy to focus only on the problem of the day. Now, when a patient comes into the clinic, their screening Rules automatically show up on our monitors which makes it easier for us to pay attention to long term health problems and preventative health care.*

- *Having these Rules in place also saves us time giving us more time to spend with the patient and less time trying to find things in a patient's file.*

- *The rules also save the health care system money as they prevent the duplication of tests as well as helping us find serious illnesses earlier in the course of that illness.*

Dr. Sharlene Hudson – M.D., C.C.F.P., BSc – Vulcan Medical Clinic

- *I am very happy with the changes that have been implemented in the last two years with our EMR. The biggest change is the decision rules that pop up whenever I log into a patient's chart. No longer do I have to hunt through the entire computerized chart at every visit to ensure patients are up to date with BMD, PAP tests, etc. The patient's unresolved preventative health measures and missing lab work pop up right away and thus allows us to order these investigations in a timely fashion with nothing being missed.*

- *Furthermore, we have trained our MOAs to order any outstanding investigations without having to talk to one of us first. This frees up more time for the physician which, in turn, allows for more physician-patient contact time.*

- *I love the fact that each physician can individualize his or her preferences to Rules for some tests so there is some flexibility and that new rules can be added easily to keep up to the ever changing medical research and new medications.*

- *The implementation of these screening Rules has definitely made my practice more efficient and also used our MOAs talents as well as they often have close relationships with our patients too and can convince them* that certain tests are needed when even we can't!

DR. MARK BOYKO – M.D., C.C.F.P., EM

- *I did a Mon-Fri locum recently in Vulcan and must say that I found the office set-up to be efficient, integrative, and easy to work in.*

- *The staff members working in the clinic are fantastic. The MOAs are a wonderful addition to help make a physician's day more about seeing patients and less about paperwork and sorting referrals. Bridget helps make office billing easy and will answer a multitude of questions promptly. The front staff schedules the day in a manageable way when you are on call.*

- *I think the patients really like the interaction with the MOA first before seeing the doctor-it makes them feel like things won't get missed. The automatic flagging system in WOLF is utilized well so that patients stay on track with blood work and screening tests.*

- *On top of this, everyone is very friendly and supportive and it is an easy atmosphere to just walk in to as a locum and work-which is the whole point! Overall a great experience and would certainly recommend Vulcan to future locums.*

BENEFITS TO THE HEALTH CARE SYSTEM

- Screening and dealing with medical issues before they become more serious can save the system large sums of money.
- This EMR Innovation can be shared and replicated in other communities throughout the Primary Care Network as well as throughout the Province.
- The Medication Reconciliation process that is being tested will help to reduce the number of medication errors, reduce the number of inadvertent side effects patients experience, and reduce the number of "forgotten" medications. The medication reconciliation process is also completed upon discharge from the hospital and these changes are entered into the patient's file by the RN along with any supporting documentation.
- Patients recently discharged from the hospital are called by the clinic's RN to review the patient's rehabilitation program in an attempt to prevent a re-admit to the hospital.
- A patient's regular physician, a locum, or an ER doctor in Vulcan, can access all of the information in a patient's file.