

## **Title**

Improving Colorectal Cancer Screening and Outcomes using an EMR Automation Model

## **Background Knowledge**

Colorectal Cancer is the second leading cause of death from cancer in the United States. This year it is estimated that there will be 147,000 newly diagnosed cases of Colorectal Cancer and nearly 50,000 deaths associated with the disease. There is considerable evidence that screening of asymptomatic persons who are at average risk can detect cancers at an early and curable stage, resulting in a reduction in mortality.<sup>i</sup> Of the methods recommended by the American Cancer Society<sup>ii</sup> or U.S. Preventive Services Task Force<sup>iii</sup>, colonoscopy is unique as it is not only a screening tool but it can also be therapeutic at the same setting, which is why it has become a preferred screening modality by many physicians<sup>iv</sup>.

As a result, millions of Colonoscopies are being performed in the United States every year, predominantly by Gastroenterologists. To date, barely half of patients eligible for colorectal cancer screening have been screened by any method, including colonoscopy<sup>v</sup>.

The volume of colonoscopies has placed a tremendous operational burden upon the Gastroenterology community. It is estimated that 50% of the labor of the average Gastroenterologist in clinical practice is spent in the performance of Screening and Surveillance Colonoscopies<sup>vi</sup>. In addition to the operational issues, these procedures are expensive and result in significant cost to the healthcare system.<sup>vii</sup> **Information Systems must be developed to provide process management to automate the Screening Process and control the costs.**

Elgin Gastroenterology (EG), an 8 physician single specialty GI practice in the Northwest Suburbs of Chicago, developed a multimedia tool and a proprietary electronic medical record (EMR) that automates the entire process of colorectal cancer screening.

## **Local Problem**

- 1) There exists a marked heterogeneity among Primary Care Physicians (PCPs) in the percentage of patients sent for Screening Colonoscopy.

- 2) Hospitals and Accreditation Agencies require a History and Physical Examination (H&P) be performed on a patient within 30 days of the performance of a Colonoscopy.
- 3) Patients require detailed instructions on prep as well as adjustments in current medications in order for the procedure to be performed safely and efficiently.
- 4) Due to financial as well as operational reasons, patients are not willing or able to come to the office to see the Gastroenterologist prior to their Colonoscopy.
- 5) Following a Colonoscopy, patients and their Primary Care Physicians (PCPs) need to be informed of the results of the examination including results of Pathology.
- 6) Recalls for follow-up Colonoscopies need to be recorded according to established guidelines.
- 7) Current Electronic Medical Record Systems either do not exist to provide solutions to the above problems or established systems need to be adapted.

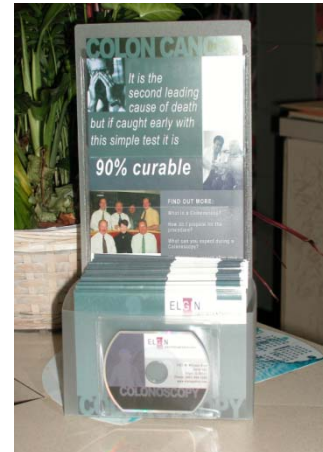
### **Intended improvement**

- Increase the level of awareness of the benefits of Screening Colonoscopy for both patients as well as PCPs.
- Improve the education of patients about the specifics of the procedure itself
- Increase the efficiency of the scheduling process
- Augment the physician's ability to make preprocedure medical decisions
- Automate the documentation process
- Generate quality metrics that could be used to improve outcomes

### **Planning the intervention**

**Step One: Problem:** Patient Education      **Solution:** Educational CDs

A request for Screening Colonoscopy (SC) is initiated either by the patient or their PCP. There is a natural reticence of patients to schedule colonoscopy due to fears of the prep, the invasive nature of the procedure itself and to the expense involved. EG noted that a marked disparity existed among its referring physicians with respect to the number of patients they sent for SC. Surveys were sent to approximately twenty-five (25) PCPs to query the cause for this disparity. The major issue was noted as a lack of time and knowledge about SC.



EG then developed an educational CD that was placed on a rack in the PCP's office. The CD included education on the need for SC, a video of a Colonoscopy, and prep and scheduling instructions. The result was a significant increase in the percentage of SCs sent by previous non-participating PCPs. A decrease in the disparity of referrals was noted and an overall increase in the number of patients sent for SC.

### **Step Two: Obtaining a Patient History**

Problem: Patients no longer can be seen in the office prior to a SC

Solution: Templated Nurse Histories in the EMR

It is a requirement of Hospital and ASC accreditation that every patient undergoing SC must have a H&P performed within 30 days of the procedure. In the past, a patient would come in to the Gastroenterologist for a Pre-Procedure Visit at which time not only would the H&P be performed, but also the procedure would be scheduled and the patient instructed on the benefits and risks of the SC as well as the details of the prep. Today this is not the case. Medicare does not pay for services in the absence of signs or symptoms. And from a practical standpoint, patients do not want to take off work to come in for this visit anyway. **A logistic and potential quality problem has thus been created for the GI practice.**

EG determined that it would be most effective to have our Endoscopy Nurses take a patient's history over the phone and enter it into the EMR. Patients referred for any procedure were scheduled for a Nurse History (NH). The nurse would utilize a template, in the EMR, with standard questions to obtain the history. In addition, patients with specific needs such as diabetics, patients on anticoagulation, and those with prosthetic heart valves, joints, pacemakers and IACDs need to be assessed. The NH provides this information to the physician. Once the NH is obtained, it is sent to the physician via a message in the EMR. It appears in the physician's inbox as "History Taken". The physician then reviews the NH and provides

appropriate orders. A form was created in the EMR that allows this to be accomplished in a matter of seconds.

**Step Three: Problem:** Documentation of the Procedure      **Solution:** EMR driven templates

At the completion of a procedure the physician creates a report. EG automated this process and developed a form as part of its EMR that provided templates and text editors to enable even the non-typist physician to create a succinct procedure note. In addition to the creation of a procedure note, the system allows for the capture of data fields for quality metrics, including prep and prep quality, cecal intubation documentation, withdrawal time, and adenomatous polyp capture rate.

**Step Four: Problem:** Appropriate Tracking of Results      **Solution:** Automessages

The results of a SC include the following:

- Normal exam (64%) - These patients do not need a repeat SC for ten years.
- Adenomatous polyp (25%) - These are significant polyps and require follow-up in 3-5 yrs
- Hyperplastic polyp (11%) - These patients do not need a repeat SC for ten years as they do not have the same premalignant potential as an Adenomatous polyp.viii

This decision for the appropriate follow-up interval cannot be made until the polyp removed has been analyzed by a pathologist. EG’s software provides for the creation of an automessage based upon the CPTix billing code the physician enters in the EMR. Through the creation of this automessage a tracking mechanism is established that maintains a list of the patients who have pending biopsy results. This eliminates delays in reviewing and/or loss of results. The physician reviews the pathology results and decides on the appropriate follow-up instructions which are provided by the software. Finally, the physician sends their orders to the nurse using a data capture form in the EMR which instructs the nurse to call and inform the patient of the results, send an autoletter to the PCP containing the findings and Gastroenterologist recommendations, and the entering of the appropriate interval for follow-up colonoscopy.

**Step Five:** Assuring Appropriate Surveillance Intervals

**Problem:** Surveillance Colonoscopy Interval

**Solution:** Integrated Guidelines

A major variable in the expense of Colorectal Cancer is the cost of the Surveillance Colonoscopy (SVC). A SVC is a follow-up colonoscopy performed on a patient who has an adenomatous

polyp. These SVCs must be performed at appropriate intervals based upon accepted guidelines which take into consideration the size of the polyps, the number of polyps and the pathology. EG has integrated the accepted guidelines into its software so that the physician is reminded of the appropriate intervals at the time a recall is established.

### **HIT Dimensions Used**

**The HIT Dimension that was used for this intervention was a client/server application composed of the following:**

- 1) PMP Database: A SQL Database residing on a server;**
- 2) PMP.mdb: An application written in Microsoft ACCESS that resided on each of the PCs;**
- 3) PMP.asp: An application written in ASP.net that allowed for remote access to the database.; and**
- 4) Centricity Practice Manager: integrated with the PMP Database.**

### **Outcomes**

1. Improved Referrals through patient education using Multimedia
  - a. Increase in total number of SCs sent to the practice
  - b. Decrease in the disparity among referring physicians
2. Improved documentation of pre-procedure H&P and procedural record
  - a. Each patient now has a documented Nurse History in the EMR prior to being scheduled for their procedure
  - b. Patient histories are reviewed by the physician before they are scheduled for the SC with specific attention paid to:
    - i. Prep tailored to the specific patient
    - ii. Need for prophylactic antibiotics
    - iii. Need for diabetic management
    - iv. Appropriate sedation needed
    - v. Appropriate location of the procedure based on patient status
3. Documentation of process measures for Colonoscopy
  - a. Indication
  - b. Sedation

- c. Prep Quality
  - d. Cecal documentation
  - e. Withdrawal time
4. Profiling of physician adherence to process measures
  5. Improvement in outcomes through adherence to guidelines for surveillance Colonoscopies
    - a. Preps have been standardized
    - b. Sedation limits have been initiated
    - c. Documentation of completeness of colonoscopy has been achieved
    - d. Surveillance intervals have conformed to set guidelines
    - e. The disparity in adenomatous polyp capture rate has been decreased

**Barriers Encountered:** See above under Planning

**Challenges Faced:** Change is always a challenge especially for professionals. The major challenge was to create the appropriate environment for the implementation of the software. A team approach was utilized with members of each level of the organization who were local champions of the process.

**Summary and Conclusions:**

1. Medical Services that are very repetitive lend themselves well to process management using EMRs
2. Patients will schedule procedures if they receive the appropriate education and procedural information. Multimedia is a very useful tool to accomplish this.
3. A template driven EMR is a very efficient way to elevate the performance of nurses in the acquisition of clinical patient data.
4. Computerized Physician Order Entry (CPOE) is efficient and well accepted by physicians if it replicates their thought processes.
5. EMRs can be made to facilitate typed procedure notes made by those with minimal typing skills.
6. Text documents should be replaced wherever possible with data fields containing documents. This allows for tracking of quality data that will ultimately lead to the ability of physicians to report their services in a manner that meets the objectives of value-based purchasing initiatives.
7. Physicians will follow guidelines if they make sense and are then incorporated into the process of their work.
8. Patient safety and quality outcomes can be improved through the use of HIT

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A. Screening for colorectal cancer. N Engl J Med 2009; 361:1179-1187

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- <sup>iiiiii</sup> Levin B, Lieberman DA, McFarland B, et al. Screening and surveillance for early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer society, the US Multi-Society Task Force on Colorectal Cancer and the American College of Radiology, *Gastroenterology* 2008; 134: 1570
- <sup>iii</sup> Preventive Services Task Force. Screening for colorectal cancer: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med* 2008;149:627-37.
- <sup>iv</sup> Schoenfeld P, Cash B, Flood A, et al. Colonoscopic screening of average-risk women for colorectal neoplasia. *N Engl J Med* 2005;352:2061-8
- <sup>v</sup> Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2007.
- <sup>vi</sup> Springer, J. Personal communication, American Gastroenterological Association membership survey, 2009
- <sup>vii</sup> Zauber AG, Knudsen AM et al. Cost-effectiveness of CT colonography to screen for colorectal cancer. Report to AHRQ from the Cancer Intervention and Surveillance Modeling Network (CISNET) for MISCAN, SimCRC, and CRC-SPIN Models, 2009
- <sup>viii</sup> Levin B, Lieberman DA, McFarland B, et al. Screening and surveillance for early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer society, the US Multi-Society Task Force on Colorectal Cancer and the American College of Radiology, *Gastroenterology* 2008; 134: 1570
- <sup>ix</sup> CPT® is registered trademark of the American Medical Association.