Physician Nonadherence to Colonoscopy Interval Guidelines in the Veterans Affairs Healthcare System

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BACKGROUND & AIMS: Colonoscopy can decrease colorectal cancer (CRC) mortality, although performing this procedure more frequently than recommended could increase costs and risks to patients. We aimed to determine rates and correlates of physician non-adherence to guidelines for repeat colonoscopy screening and polyp surveillance intervals. **METHODS:** We performed a multi-center, retrospective, observational study using administrative claims, physician databases, and electronic medical records (EMR) from 1455 patients (50–60 y old) who underwent colonoscopy in the Veterans Affairs healthcare system in fiscal year 2008. Subjects had no prior diagnosis of CRC or inflammatory bowel disease, and had not undergone colonoscopy examinations in the previous 10 years. We compared EMR-documented, endoscopist-recommended intervals for colonoscopies with intervals recommended by the 2008 Multi-Society Task Force guidelines. **RESULTS:** The overall rate of non-adherence to guideline recommendations was 36% and ranged from 3% to 80% among facilities. Nonadherence was 28% for patients who underwent normal colonoscopies, but 45%−52% after colonoscopies that identified hyperplastic or adenomatous polyps. Most of all recommendations that were not followed recommended a shorter surveillance interval. In adjusted analyses, non-adherence was significantly higher for patients whose colonoscopies identified hyperplastic (odds ratio [OR] = 3.1; 95% CI, 1.7–5.5) or high-risk adenomatous polyps (OR = 3.0; 95% CI, 1.2−8.0), compared to patients with normal colonoscopy examinations, but not for patients with low-risk adenomatous polyps (OR = 1.8; 95% CI, 0.9–3.7). Non-adherence was also associated with bowel preparation quality, geographic region, Charlson comorbidity score, and colonoscopy indication. **CONCLUSIONS:** In a managed care setting with salaried physicians, endoscopists recommend repeat colonoscopy sooner than guidelines for more than one third of cases. Factors associated with non-adherence to guideline recommendations were colonoscopy findings, quality of bowel preparation, and geographic region. Warning endoscopists about non-adherence to colonoscopy guidelines could reduce overuse of colonoscopy and associated healthcare costs.

Keywords: Colon Cancer; Early Detection; VA.

Colonoscopy is an effective tool to decrease the incidence and mortality of colorectal cancer (CRC),[1,2] the second leading cause of cancer-related deaths in the United States.[3,4] In addition, CRC has an enormous financial impact accounting for a national cost of over $14 billion in 2010.[5] After a normal colonoscopy the US Multi-Society Task Force (MSTF) guideline recommends that the next colonoscopy for screening be performed in 10 years.[6,7] Shorter intervals are recommended when neoplasia (i.e. adenomatous polyps) are found. Repeat colonoscopies can provide effective longitudinal screening and polyp surveillance, but repeating colonoscopies sooner, and therefore more frequently, than recommended by guidelines may increase cost and risk without increasing patient benefit. Overuse of repeat colonoscopy also reduces the capacity to perform colonoscopy for initial screening colonoscopies or evaluation of symptoms.

The Department of Veterans Affairs (VA) is the United States' largest integrated health care system. VA provides comprehensive care to more than 8.3 million Veterans each year.[8] CRC is the third most frequently diagnosed cancer among VA patients, and is a leading cause of cancer death in the VA.[9] As a result of quality improvement efforts in VA, CRC screening has increased in recent years and, along with the fecal occult blood test (FOBT), colonoscopy is one of the most commonly used screening modalities within this healthcare system.[10,11] The rate of adherence to repeat colonoscopy guidelines by VA physicians has not been measured to date. Given the continual rise of healthcare costs, and the limited resources to provide colonoscopy, in particular, it is critical to determine whether VA providers are recommending repeat colonoscopy at appropriate intervals. The primary aim of this study was to determine the rate of physician non-adherence to MSTF guidelines for screening and polyp surveillance, as measured by endoscopist-documented recommendations for next

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colonoscopy, from a representative sample of VA medical facilities. Our secondary aim was to identify patient, physician, and facility characteristics associated with physician non-adherence to MSTF guidelines. Results from this study can inform efforts to improve CRC screening and surveillance programs, to enhance provider education, and to better align use of colonoscopy for CRC screening and surveillance with clinical guidelines.

Methods

Data Collection

We extracted patient demographic and clinical information (e.g. ICD-9 codes and CPT codes) from VA administrative claims databases. Index colonoscopy pathology report results were manually abstracted from VA electronic medical records (EMR) using VistAWeb, a VA intranet web application that provides read-only access to individual patient electronic health records. The manual EMR abstraction process included a data dictionary, a structured data collection form, and a detailed hierarchical abstraction protocol. The data collection form and abstraction protocol were pilot-tested. All EMR data were abstracted by two research assistants. Each research assistant abstracted a randomly chosen 5% sample of study subjects assigned to the other research assistant. The abstraction records for the randomly chosen sample were compared to the corresponding original abstraction records using PROC COMPARE in SAS v9.2.[12] The project manager (MJ) and principal investigator (DF) reviewed discrepancies with the research assistants for ongoing training and quality assessment. Physician demographic information was extracted from the American Medical Association (AMA) Masterfile physician database. VA medical center characteristics (eg, academic affiliation, complexity) were identified using the Veterans Health Administration Site Tracking (VAST) report,[13] the VHA Medical SAS Datasets, and the FY 2008 (Fiscal Year 2008: October 1, 2007 - September 30, 2008) Facility Complexity Level Model (Appendix 1). This study was approved by the Durham VA Medical Center Institutional Review Board (IRB) (Protocol no. 1351).

Medical Facility Selection

VA medical facilities are categorized by complexity level which is determined by characteristics of the patient population, clinical services offered, education and research missions, and administrative complexity.[14] In FY 2008, there were 137 medical facilities with complexity level scores of which, 83 performed at least 500 colonoscopies in FY 2008 and had the full colonoscopy reports available in VistAWeb (as determined by chart review of 3 randomly chosen FY 2008 Veteran colonoscopy records per medical center). At the time of the study some VA medical facilities stored endoscopy reports as an image rather than a text report and these images were not available to the researchers for abstraction. Therefore, facilities using this process were excluded (Figure 1). We created a sampling algorithm that stratified by academic affiliation (non-academic vs. academic), geographic region (Northeast, South, Midwest, West), and complexity level (high vs. medium/low). We selected a sample of 25 medical facilities that were representative of the distribution of these characteristics (academic affiliation, region, complexity

level) in the full set of 83 eligible facilities. Facilities were randomly selected within each academic affiliation*geographic region*complexity level stratum (Figure 1).

Patient Selection

We sampled patients from FY 2008 (October 1, 2007–September 30, 2008) national outpatient data sets (Figure 2). Inclusion criteria for the initial data pull were: age 50-64 and presence of a colonoscopy CPT code (44388, 44389, 44390, 44391, 44392, 44393, 44394, 44395, 44396, 44397, 45355, 45378, 45379, 45380, 45381, 45382, 45383, 45384, 45385, 45386, 45387, 45394, 45397, G0105, G0121, 0105, 0121). Patients were then excluded if they had had ICD-9 codes for: 1) history of colon or rectal cancer (153.xx, 154.xx); 2) colon or rectal carcinoma in situ (230.3, 230.4); or 3) inflammatory bowel disease (555.xx, 556.xx, 558.9). Additionally, patients were excluded if they had a colonoscopy within the VA or paid for by the VA (via the fee-basis program) during the 10 years preceding their FY 2008 index colonoscopy. None of the FY2008 index colonoscopies that were included in our sample were performed at a non-VA site.

We selected one hundred patients who met these criteria from each of 25 VA medical facilities using a complex sample design to oversample women and minorities. This number was based on the sample size needed to estimate an assumed proportion of guideline-adherent recommendations for repeat colonoscopies of 0.60 with a precision of 0.03, incorporating a design effect to reflect clustering at the facility level (using a conservative ICC of 0.02). This calculation yielded a sample size of 100 patients per each of 21 facilities. The number of facilities was increased to 25 ensure the goal of 21 facilities with complete data.

Our goal was to include 56 white non-Hispanic men, 19 white non-Hispanic women, 19 minority men, and 6 minority women from each facility to obtain a 25% sample of women and a 25% sample of minorities. Patients with missing race or gender data were excluded; furthermore, the additional study exclusions that were applied to patients who were eligible for our study but were not included in the analyses for this manuscript are listed in Figure 2 (Additional Study-specific Exclusions). VA users are approximately 80% White and 11% African American[15] For these 2 racial categories the estimated concordance of VA data with Medicare data are 96-99%.[16] EMR abstractions were conducted on the selected patients. For this analysis we further excluded patients with a/an: 1) family history of colon cancer in a 1st degree relative, or documented family history of colon cancer without specification of affected family member(s); if a family history was not documented, then it was assumed to not be present; 2) colonoscopy that did not reach the cecum or cecum and ileum; 3) colonoscopy and histology findings that did not fit into one of the clinical risk groups: "no polyps/normal tissue", "low risk adenomas", "high risk adenomas" "hyperplastic polyps only" or had insufficient data to assign clinical risk group; 4)missing repeat colonoscopy recommendation; 5) inadequate bowel preparation; 6) piece-meal polyp resection. If the desired frequency for a given race*gender cell could not be filled because there were insufficient eligible patients at that medical center to meet a race* gender goal, the frequencies for the remaining cells were increased, first by trying to meet the oversampling goals, and then by increasing the number of white non-Hispanic males.