Residency Education

The Current State of Colonoscopy Training in Family Medicine Residency Programs

Thad Wilkins, MD; David Jester, MD; Jennifer Kenrick; Julie Dahl, DO

Background and Objectives: The US Preventive Services Task Force has recommended that all adults ages 50 and over be screened for colorectal cancer. Colonoscopy is the most accurate screening procedure, but the feasibility of colonoscopy as a screening tool is limited by the number of physicians trained to perform it. This study determined the current state of colonoscopy training in US family medicine residency programs. Methods: We surveyed program directors of all Accreditation Council for Graduate Medical Education-approved family medicine residency programs regarding colonoscopy training. Results: The response rate was 94% (426 of 455). Forty-eight percent (n=201) of directors reported that their program offered colonoscopy training, but only 18% (n=75) of all respondents had actually trained one or more residents to do colonoscopies. Nationally, the mean number of colonoscopies performed per resident was 42.6 ± 3.9. Regional differences were reported; residents trained in the western United States performed a mean of 69.8 ± 12.8 colonoscopies per resident. Gastroenterologists in hospital-based gastroenterology suites trained approximately 75% of family medicine residents. Fifteen percent (n=64) of directors reported that 133 (4%) of their July 2002 graduates sought credentials to perform colonoscopy. Conclusions: Only a minority of family medicine graduates seek credentials to perform colonoscopy, and significant regional differences in training exist.

Colorectal cancer is the second leading cause of cancer death in men and women in the United States. It is estimated that colorectal cancer will cause approximately 56,730 deaths in 2004, accounting for 10% of cancer deaths.

The US Preventive Services Task Force strongly urges that all adults ages 50 and over be screened for colorectal cancer.2,3 In 1997, the Agency for Health Care Policy and Research (AHCPR) recommended that beginning at the age of 50, people should undergo one of the following screening regimens: fecal occult blood testing (FOBT) annually, flexible sigmoidoscopy every 5 years, FOBT and sigmoidoscopy every 5 years, double contrast barium enema every 5 to 10 years, or colonoscopy every 10 years.4 Among the available screening options, FOBT and sigmoidoscopy have been the most well-studied methods for colorectal cancer screening,5 but only one third of Americans are screened by FOBT or sigmoidoscopy.6 Recent evidence suggests that colonoscopy may be a useful screening procedure for colorectal cancer.7,8 There are many barriers that preclude individuals from receiving colorectal cancer screening, including patient, physician, and health system factors.9 One health system barrier is the lack of capacity to perform screening tests, including colonoscopy, on all eligible patients.

While the majority of family medicine residencies provide training in flexible sigmoidoscopy, a prior study reported that only one in four family medicine residents provide training in colonoscopy.10 Training requirements vary widely by professional organization and subspecialty. The American College of Physicians recommends 50 colonoscopies for acquisition of clinical competence, while the American College of Gastroenterology (ACG), the American Gastroenterological Association (AGA), and the American Society for Gastrointestinal Endoscopy (ASGE) have recommended performing as many as 140 supervised colonoscopies and 30 polypectomies as a minimum training requirement for hospital privileges.12,13 Although family phy-
sicians have demonstrated competency to perform colonoscopy, only 3.2% of US family physicians routinely perform colonoscopy in their office, and 2.4% perform colonoscopy in hospital-based gastrointestinal suites.

To date, no study has evaluated the extent of colonoscopy training in family medicine residencies and the number of residents who seek credentials in colonoscopy after completion of their family medicine residency. To describe the current state of colonoscopy training in family medicine, we surveyed residency directors to determine the number of programs offering colonoscopy training, the number of residents receiving this training, the number of colonoscopies performed during residency, the specialty of the preceptor, and the setting where the procedures were performed. We also asked residency program directors to report the number of residents who sought credentials in colonoscopy following graduation.

Methods

A survey instrument was designed to assess the extent of colonoscopy training being offered in US family medicine residency programs. The instrument included questions about program type, state location, and whether colonoscopy training was offered to residents. For programs that offered training, we asked location of training (e.g., hospital-based endoscopy suite, surgery clinic, family medicine clinic, etc.) and supervisor of training (e.g., family physician, gastroenterologist, etc.). Open-ended questions were asked to ascertain (1) the minimum number of colonoscopies residents were expected to perform, (2) the number of graduates from last year’s class who applied for credentials to perform colonoscopy, and (3) of those who applied for credentials, the average number of colonoscopies they performed during their residency training. We pretested our survey instrument on teaching faculty and made appropriate modifications prior to mailing.

In January 2003, 455 surveys were mailed to program directors from all Accreditation Council for Graduate Medical Education (ACGME)-approved family medicine residency programs. To enhance the response rate, the survey was mailed a second and third time at 20-day intervals to nonrespondents. No other means of contact to nonrespondents was made, and all responses were anonymous. The study was reviewed and approved by our local institutional review board.

Data Analysis

For statistical comparison of the numbers of colonoscopies performed in residency programs and the number of residents seeking credentials by program type and region, we used Pearson chi-square test. Student t test was used to compare the mean number of colonoscopies performed and the number of residents who sought credentials for colonoscopy by program type and region of the country in which the program was located. We used Pearson’s correlations to determine the association of the number of colonoscopies performed during residency training and the number of residents who sought colonoscopy credentials. SPSS version 11 was used for all analyses.

Results

Of the 455 surveys mailed, 426 (94%) were completed and returned. A total of 201 (48%) program directors reported that their program offered colonoscopy training, but only 75 (18%) had actually trained at least one resident. Among the 18% of programs that did train residents in colonoscopy, the number of colonoscopies performed by residents ranged from 5 to 150, with a mean of 42.6 ± 3.9 colonoscopies per resident. Of those 75 programs that trained residents in colonoscopy, 19 (5%) directors reported that their residents performed 1 to 24 colonoscopies during residency training, 18 (4%) directors reported 25 to 49 procedures, and 38 (9%) directors reported that their residents performed 50 or more colonoscopies during residency training. The number of colonoscopies performed during residency training was correlated with the number of residents applying for colonoscopy credentials (r = .38, P = .01).

Only 64 (15%) residency programs reported that one or more of their graduating residents from July 2002 sought credentials to perform colonoscopy. Among these programs, nine (14%) were community based, 26 (41%) were community based and medical school affiliated, 22 (34%) were community based and medical school administered, and six (9%) were medical school based. On average, two residents from each of these 64 programs applied for colonoscopy credentials, with an average of 58 colonoscopies performed per resident during their training period.

Significant regional differences exist in the United States regarding colonoscopy training. Sixty-three percent of programs in the Plains-Mountain states offered colonoscopy training, but only 42% of programs on the East Coast and 30% of programs on the West Coast provided colonoscopy training (P = .003). However, residents on the West Coast performed a mean of 69.8 ± 12.8 colonoscopies while residents on the East Coast performed a mean of 14.0 ± 4.9 colonoscopies (P = .002) (Table 1). Among programs offering colonoscopy training, there was no significant difference by program type (Table 2).

The most common training site was the hospital-based endoscopy suite (73%). About one in five residents were trained in family medicine or surgery clinics. Residents trained in surgery clinics performed more colonoscopies than residents trained in either hospital-based endoscopy suites or family medicine clinics.
Table 1

Colonoscopy Training in Family Medicine Residencies, by Region of the United States (n=419)*

<table>
<thead>
<tr>
<th>Region</th>
<th># of Programs Offering Colonoscopy Training</th>
<th>Mean # of Residents Applying for Colonoscopy Credentials ± SE**</th>
<th>Mean # of Colonoscopies Per Resident ± SE***</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>89 (42)</td>
<td>0.1 ± 0.1</td>
<td>14.0 ± 4.9</td>
</tr>
<tr>
<td>South</td>
<td>87 (52)</td>
<td>1.0 ± 0.2</td>
<td>46.2 ± 7.8</td>
</tr>
<tr>
<td>Midwest</td>
<td>115 (58)</td>
<td>0.4 ± 0.1</td>
<td>35.3 ± 7.7</td>
</tr>
<tr>
<td>Plains-Mountains</td>
<td>62 (63)</td>
<td>1.4 ± 0.4</td>
<td>43.9 ± 5.9</td>
</tr>
<tr>
<td>West</td>
<td>66 (30)</td>
<td>1.1 ± 0.3</td>
<td>69.8 ± 12.8</td>
</tr>
</tbody>
</table>

1 P=.003
2 P<.001
3 P=.002

* Seven program directors did not specify state.
** In programs that provide colonoscopy training

Table 2

Colonoscopy Training in Family Medicine Residencies, by Program Type (n=420)*

<table>
<thead>
<tr>
<th>Program Type</th>
<th># of Programs Offering Colonoscopy Training</th>
<th>Mean # of Residents Applying for Colonoscopy Credentials ± SE**</th>
<th>Mean # of Colonoscopies Per Resident ± SE***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community based</td>
<td>51 (55)</td>
<td>0.8 ± 0.3</td>
<td>42.9 ± 9.5</td>
</tr>
<tr>
<td>Community based and medical school affiliated</td>
<td>233 (46)</td>
<td>0.6 ± 0.1</td>
<td>38.6 ± 5.7</td>
</tr>
<tr>
<td>Community based and medical school administered</td>
<td>71 (55)</td>
<td>1.1 ± 0.2</td>
<td>49.6 ± 7.9</td>
</tr>
<tr>
<td>Medical school based</td>
<td>54 (43)</td>
<td>0.5 ± 0.2</td>
<td>46.3 ± 10.8</td>
</tr>
<tr>
<td>Military</td>
<td>11 (27)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>420 (48)</td>
<td>0.7 ± 0.1</td>
<td>42.6 ± 3.9</td>
</tr>
</tbody>
</table>

1 P=not significant

* Six program directors did not specify program type.
** In programs that provide colonoscopy training

SE—standard error

Discussion

Almost half of program directors reported that their program offered colonoscopy training. This is a striking increase from the 26% who reported such training in 1995.20 Of the 3,347 family medicine graduates in 2002,21 133 (4%) sought credentials for colonoscopy, and their training occurred in 64 (15%) residency programs.

Considering that half of family medicine residency programs offer colonoscopy training, very few residents continue to perform colonoscopy after graduation. According to a recent American Academy of Family Physicians (AAFP) survey of active members, the reasons colonoscopy were not being performed included: performance of colonoscopy was not desired (70%), privileges were denied (2%), liability was prohibitive (1%), fear of liability suit (1%), and no hospital department in which to perform colonoscopy (1%).20

Further, there were significant regional differences in resident training as well as the number of residents seeking credentials in colonoscopy. Residents trained in the western United States averaged the highest number of procedures, while those trained in the Plains-Mountain states had the highest rate of application for credentials. While the number of colonoscopies performed in training was correlated with the rate of application for credentials in colonoscopy, other variables may also be a factor in the decision to apply
for credentials, such as practice setting, likelihood of reimbursement, and access to other specialists who can perform colonoscopy.

We noted that residents trained in programs affiliated with medical schools, but based in separate community facilities, had a higher likelihood of applying for credentials and tended to perform more colonoscopies than residents trained at other program types. Programs based within medical school tertiary care hospitals had a lower number of residents who sought credentials, which may reflect the highly specialized environment of these academic health centers, the practice choices of the graduates of these programs, or other unidentified factors. Another major difference was noted when comparing the location of training and the specialty of the preceptor who was teaching colonoscopy. Approximately 75% of residents were trained by gastroenterologists in endoscopy suites. However, residents trained in surgery clinics tended to perform more procedures than residents trained in other locations, and residents trained in family medicine centers were more likely to apply for credentials than residents trained in other locations. The mentorship of family medicine faculty seems to be an important factor in the decision of residents to perform colonoscopy after graduation. Further, residents who were trained by family physicians or internal medicine faculty were four times more likely to seek credentials as those trained by gastroenterologists. One possibility might be that residents trained in endoscopy suites by specialists were less comfortable in applying for credentials. It should also be noted that residents trained by gastroenterologists performed fewer procedures than those trained by other faculty. This may reflect the complexity of the cases seen by gastroenterologists, which could also be a negative influence on the decision to seek credentials after graduation.

**Limitations**

An important limitation of this study is that our results relied on the reports and recall of residency program directors, and these may not accurately reflect the total number of procedures performed or the number of residents who sought credentials. Our numbers may be higher than actual numbers since program directors may overestimate resident training in colonoscopy. Another potential limitation was the use of residents seeking credentials as a surrogate for those performing the procedure after graduation. While most physicians perform this procedure in a hospital surgical suite or endoscopy center, recent data suggest that some family physicians choose to perform colonoscopy in their offices and, therefore, recent graduates would not need to apply for credentials. Our study was not designed to collect information on graduates performing office-based colonoscopy. Additionally, our study was not designed to collect information on residents in whom credentialing was denied based on their residency training. We also did not seek information on whether residents were trained in biopsy or polypectomy procedures during their training, and if this affected their willingness to seek credentials.

**Implications**

In a recent publication endorsed by the ACG, the AGA, and the ASGE, the minimum number of colonoscopies was 140, and the minimum number of polypectomies was 30, an increase from 100 colonoscopies and 25 polypectomies. Additionally, these organizations call for objective performance criteria, including intubation of the splenic flexure, intubation of the cecum, and intubation of the terminal ileum. However, these recommendations are based on expert consensus. The AAFP recommends that skill

---

**Table 3**

Location and Specialty of Preceptor for Colonoscopy Training in Family Medicine Residencies

<table>
<thead>
<tr>
<th>Location* of colonoscopy training (n=200)</th>
<th># of Programs Offering Colonoscopy Training n (%)</th>
<th>Mean # of Residents Applying for Colonoscopy Credentials ± SE**</th>
<th>Mean # of Colonoscopies Per Resident ± SE**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital-based endoscopy suite</td>
<td>146 (73)</td>
<td>0.7 ± 0.1</td>
<td>45.0 ± 4.3</td>
</tr>
<tr>
<td>Family medicine clinic</td>
<td>39 (20)</td>
<td>1.7 ± 0.3</td>
<td>44.5 ± 6.2</td>
</tr>
<tr>
<td>Surgery clinic</td>
<td>36 (18)</td>
<td>1.0 ± 0.3</td>
<td>54.7 ± 7.9</td>
</tr>
<tr>
<td>Endoscopy clinic</td>
<td>60 (30)</td>
<td>0.5 ± 0.2</td>
<td>39.8 ± 7.9</td>
</tr>
<tr>
<td>Other</td>
<td>11 (6)</td>
<td>0.7 ± 0.4</td>
<td>28.3 ± 14.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specialty* of preceptor for colonoscopy training (n=201)</th>
<th># of Programs Offering Colonoscopy Training n (%)</th>
<th>Mean # of Residents Applying for Colonoscopy Credentials ± SE**</th>
<th>Mean # of Colonoscopies Per Resident ± SE**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family physician</td>
<td>73 (36)</td>
<td>1.6 ± 0.2</td>
<td>50.2 ± 4.6</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>142 (71)</td>
<td>0.4 ± 0.1</td>
<td>33.1 ± 4.8</td>
</tr>
<tr>
<td>General surgeon</td>
<td>69 (34)</td>
<td>1.1 ± 0.2</td>
<td>56.1 ± 6.1</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>5 (3)</td>
<td>1.6 ± 0.8</td>
<td>54.3 ± 16.4</td>
</tr>
<tr>
<td>Other</td>
<td>11 (6)</td>
<td>0.1 ± 0.1</td>
<td>25.0 ± 25.0</td>
</tr>
</tbody>
</table>

* Directors could have chosen more than one location or specialty of preceptor.

** In programs that provide colonoscopy training

SE—standard error
level, rather than the absolute number of procedures, be used to determine privileging decisions. In our study, there was a wide range from 5 to 150 in the number of colonoscopies performed by residents, with most performing about 35 to 45 procedures. Future studies should explore the competency in colonoscopy in graduating family medicine residents and factors associated with competency, such as the absolute number of procedures performed, procedure time, complications, etc.

Conclusions

Our results indicate that while almost half of family medicine residency programs offer training in colonoscopy, few graduates seek credentials to perform this procedure after graduation. Significant regional differences were noted in the number of procedures and seeking of credentials. Medical students interested in colonoscopy training may want to use this information when choosing a residency program. It also seems important for residents to be trained by generalists, especially other family physicians, if they are to pursue credentials in colonoscopy following graduation.

Based on our data, residency programs may want to evaluate their ability to train residents in colonoscopy. There may be a need to pool resources and encourage some programs not to teach this procedure if resources are not available.

Finally, future research is needed to determine the significance, if any, between the total number of procedures performed and demonstrated proficiency. We also need data from recent graduates on training available during residency and what factors influenced their decision to perform colonoscopy, the credentialing process, and where they choose to perform their procedures after graduation.

Corresponding Author: Address correspondence to Dr. Wilkins, Medical College of Georgia, HB–4031, Augusta, GA 30912. 706-721-8018. Fax: 706–721-7518. twilkins@mail.mcg.edu.

REFERENCES