Author's response to reviews

Title: Endoscopist specialty is associated with colonoscopy quality

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Version: 3 Date: 3 April 2013

Author's response to reviews: see over
April 2, 2013

Re: Manuscript revision; MS: 7622929278420881; Endoscopist specialty is associated with colonoscopy quality

Dear Dr. El-Matary,

We appreciate the reviewers’ valuable feedback on our manuscript. We have revised it as detailed below and are resubmitting it for your consideration.

Reviewer 1:

1. Define polypectomy rate in abstract and manuscript
   We agree with the reviewer that “rate” is not being used appropriately in the strict epidemiological sense. Nevertheless, polypectomy rate is the term that is used pervasively throughout the literature. We have added the definition “Polypectomy rate is defined as the proportion of colonoscopies that result in the removal of one or more polyps.” in both the abstract (Page 2 Paragraph 1) and introduction (Page 4 Paragraph 2).

2. State the reference group for specialty in abstract
   The odds ratio compares “surgeons to gastroenterologists” (Page 2 Paragraphs 2&3).

3. Why was polypectomy rate obtained from administrative data?
   As described in the manuscript, this study is a secondary analysis that combines data from two prospective cohort studies (Page 5 Paragraph 2). Polypectomy information from chart review was available for only the Montreal sample, which we had used to validate the administrative data in a previous study (Page 7 Paragraph 1 and Reference 19).

4. It is not clear how model adjustment for polypectomy misclassification was done. Is misclassification differential?
   The adjustment for misclassification used sensitivity and specificity that were obtained from our previous validation study (Page 7 Paragraph 1 and Reference 19). We agree with the reviewer that differential misclassification is a possible source of bias, and have included this as a study limitation: “However, our approach to misclassification adjustment for the Montreal data may have introduced bias if misclassification was differential between surgeons and gastroenterologists. Differences in administrative data quality between specialties may arise from differences in billing.
practices. Nevertheless, it is reassuring that the Calgary sample, where misclassification was reduced by combining two sources of data, showed results in the same direction as the Montreal sample.” (Page 12 Paragraph 2).

5. Were there patients who had more than one colonoscopy during the study period?
For patients, only the first colonoscopy was included (Page 6 Paragraph 2).

6. Endoscopist-level factors may account for some of the variation
We acknowledge that endoscopist-level factors (practice factors, technical factors) may play a role, and have discussed studies that examine these factors in the discussion (Page 10 Paragraph 3 – Page 11 Paragraph 3). The question that our study is designed to answer is “whether there is a difference in polypectomy rate between surgeons and gastroenterologists beyond what is attributable to differences in patient risk profiles” (Page 5 Paragraph 1). We acknowledge this limitation in the discussion. “Although our findings highlight the important issue of the discrepancy in quality between surgeons and gastroenterologists, the lack of endoscopist-level variables in our study preclude us from isolating the modifiable predictors of endoscopist performance. Future studies aimed at teasing out factors would help inform changes to training, accreditation, and quality assurance programs. We hope that our findings will serve as impetus for such investigations” (Page 12 Paragraph 2)

7. The study is limited in that it does not address factors such as volume and training
See response to #6.

8. The study is limited in that it does not explain technical reason for differences between specialties
See response to #6.

Reviewer 2:

1. Is it the medical specialty itself that is an independent predictor or is it the experience of the physician performing the colonoscopy or other factors?
See response to Reviewer 1, #6.

2. Check reference #1 with respect to relevance to implementation of CRC screening
Reference #1 has been corrected.

3. Remove “operator dependent procedure” from introduction
Removed.

4. Reconsider “a colonoscopy quality assurance movement is underway in the developed world”
“Colonoscopy quality assurance initiatives are underway in several countries” as indicated by references 2-4, which represent the U.S., the U.K., and Canada, respectively (Page 4 Paragraph 1).

5. Is specialty an independent predictor of colonoscopy quality?
See response to Reviewer 1, #6.

6. Benchmarks don’t aim at lowering variability
“The establishment of benchmarks aims to standardize colonoscopy practice quality” (Page 4 Paragraph 1).

7. Discuss the results of published studies on endoscopist specialty in more depth
We have included a description of endoscopist level covariates included in each of the 4 studies on endoscopist specialty and missed cancers (Page 9 Paragraph 1).

8. Update review of literature on the correlation between specialty and ADR
Several studies on the topic, including the two cited by the reviewer, have been published in the 5 months since our manuscript was initially submitted. We have updated the discussion to include the new studies (Page 10 Paragraph 3 – Page 11 Paragraph 3). In total, 5 additional relevant references were added.

9. No changes recommended for statistical methods
10. Who are the people excluded because they are not covered by provincial health insurance THIS NEEDS TO BE INSERTED IN THE MANUSCRIPT
Potential reasons for not being covered by provincial health insurance include being in the military or RCMP, being treaty status Indians, and patients considered residents of another province. The reason for this exclusion criterion is that we were only able to link to provincial records in Quebec and Calgary.

11. Define covariates in the model
“Patient-level risk factors for CRC and adenoma: age (50-54/55-59/60-64/65-70/70-75), sex, family history of CRC (y/n), previous colonoscopy (y/n), and colonoscopy indication (screening/non-screening). Screening was defined as no history of large bowel symptoms (rectal bleeding, unintentional weight loss, abdominal pain) in the past 6 months, and no history of gastrointestinal conditions (polyp, CRC diagnosis, inflammatory bowel disease, and previous bowel surgery).” (Page 6 Paragraph 3)

12. There is no time reference for the number of patients per endoscopist
We did not have volume information on endoscopists. The number of patients per endoscopist in the study is not reflective of endoscopist volume.

13. Clarify “the odds of specialty”
“The odds ratios for polypectomy with surgeons as compared to gastroenterologists” (Page 8 Paragraph 2)

14. Clarify “dose-response” with age
“Increase in the probability of polypectomy with increasing age” (Page 8 Paragraph 4)

15. Explain the high polypectomy rate of 62.1%
62.1% is the highest polypectomy rate estimate seen among gastroenterologists and represents that physician’s estimated polypectomy rate for typical patients. This figure is for polypectomy rate and not adenoma detection rate, which would be considerably smaller.
Provide a more in depth discussion of results and implications
We have expanded the discussion (Page 10 Paragraph 3 – Page 12 Paragraph 2).

16. Provide references for the assertion that administrative data is subject to misclassification
“Administrative codes tend to have good specificity but poor sensitivity [19, 21].” (Page 7 Paragraph 1)

17. Clarify conclusion regarding the current findings
These findings show that there is a difference in practice quality between specialties beyond what is attributable to variation in patient risk profiles. Potential reasons for this discrepancy, such as
training, practice volume, and technical factors, need to be investigated further in future studies.”

(Page 13 Paragraph 2)

18. The correlation between missed cancers and specialty is emphasized, even though this paper is about polypectomy rates

Missed cancer is a downstream outcome that is indicative of quality. “Polypectomy rate is an upstream marker of quality because failure to remove and diagnose cancerous and pre-cancerous lesions leads to missed cancers. It is, therefore, conceivable that differences in missed cancers between specialties may have originated with specialty differences in polypectomy rates.” (Page 4 Paragraph 3) This is the study rationale.

19. Report the mean and standard deviation of age in the text of results instead of in table 1

This is fairly common practice. Removing age from the table would make it incomplete.

20. Remove 100% from the bottom of the columns of table 1

Removed.

21. The bullets in the tables are unusual

Markers for the table notes have been replaced with a new set.

22. Clarify the title of table 2

“Odds ratio estimates for polypectomy from hierarchical logistic regression models for Montreal and Calgary.”

23. Indicate the reference category for each variable in table 2

Table notes have been revised.

24. Define covariates in table 2 caption

Table notes have been revised.

25. Use the same scales for both graphs of figure one

The ranges of estimates are different between the two specialties. The distribution of variation is best illustrated in each specialty by using different scales.

26. Clarify caption of figure 1

Covariate definitions were clarified in the caption.

27. Update literature review

See response to #8.

28. Proofread and edit manuscript

The manuscript has been proofread and revised.

Editorial requests:

1. Include author contributions

This had been added (Page 13 Paragraph 4).

2. Include competing interests

3. This had been added (Page 13 Paragraph 3).

4. Proofread and edit manuscript

The manuscript has been proofread and revised

Sincerely,

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