

# OBSTETRICS & GYNECOLOGY



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- Comments from the reviewers and editors (email to author requesting revisions)
- Response from the author (cover letter submitted with revised manuscript)\*

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**Date:** Dec 10, 2020  
**To:** "Tess Crouss" [REDACTED]  
**From:** "The Green Journal" em@greenjournal.org  
**Subject:** Your Submission ONG-20-3026

RE: Manuscript Number ONG-20-3026

Vaginal Hysterectomy Rates Before and After Implementation of a Multi-Tier Intervention

Dear Dr. Crouss:

Your manuscript has been reviewed by the Editorial Board and by special expert referees. Although it is judged not acceptable for publication in Obstetrics & Gynecology in its present form, we would be willing to give further consideration to a revised version.

If you wish to consider revising your manuscript, you will first need to study carefully the enclosed reports submitted by the referees and editors. Each point raised requires a response, by either revising your manuscript or making a clear and convincing argument as to why no revision is needed. To facilitate our review, we prefer that the cover letter include the comments made by the reviewers and the editor followed by your response. The revised manuscript should indicate the position of all changes made. We suggest that you use the "track changes" feature in your word processing software to do so (rather than strikethrough or underline formatting).

Your paper will be maintained in active status for 21 days from the date of this letter. If we have not heard from you by Dec 31, 2020, we will assume you wish to withdraw the manuscript from further consideration.

#### REVIEWER COMMENTS:

Reviewer #1:

1. Objective was clearly stated: to compare rates of TVH/TVH composites after multi-tier intervention
2. I commend the authors on a strong development of an educational program to assist with attending and resident training for TVH. I think that the authors would add more information to this study to help other programs if they also report how many of the faculty are ob/gyn and urogyn and look at the numbers of TVH from pre and post based on individuals surgeon demographic information (example: ob/gyn, urogyn, rei, etc, years in practice,) This will allow not only to see if the intervention not only increased the numbers of TVH as a department but also to see if this helped to increase numbers in all faculty members. Also report how many of these surgeries utilized in the protocol the use of the mentorship program. I also think it would be helpful to see if there was any time in the post intervention that these same surgeons that used the mentorship then stopped using the mentorship program. I feel this would give more long term useful information for other departments to understand what is truly involved in this interventional program. I also feel that if utilization of mentorship was often used that this could be a larger reason why faculty started to perform TVH and help give an overall understanding of barriers and what helps surgeon move forward with TVH.
3. I would ask the authors to also in discussion to add more on how this study is not generalizable to all programs. Limitations may include ability to provide dedicated mentorship and also that each program may have other barriers to performing TVH. Also lack of simulations centers in other programs. It would be helpful to have authors state in methods what kind of simulation they used for resident and faculty in methods as well.

Reviewer #2: This study presents the outcome of interventions to increase the rates of vaginal hysterectomy in a residency program. The intervention was four tiered program which was formulated and spearheaded by The Female Pelvic Medicine and Reconstructive Surgery Division (FMPRS). The plan was tier 1- educational workshops for residents; tier 2- professional development for Attendings; tier 3 - clinical pathway for decisions on type of hysterectomy for a given patient ; tier 4 Mentorship. The authors then in a retrospective study examined the effect of this program by examining outcomes, types of hysterectomies for 24 months preceding the program and 26 months after its implementation.

Primary aim was to compare the TVH rates before and after implementation of the multi-tier intervention to increase vaginal hysterectomy rates. Secondary aim was to assess other factors that influence hysterectomy

They presented analysis of 698 hysterectomies , 253 before the educational program and 445 after the program. They showed data on TVH, TAH, Supra-cervical Hysterectomies. LAVT and Robotic Hysterectomies. The conclusions showed an increase of TVH of 5.5% to 26.5% so met the primary objective  
It is the secondary objectives that the authors do not show data in decision making, barrier training outcomes, change if any on attending attitudes - all secondary outcomes

A number of questions arise:

1. Why did the number of hysterectomies in post-program increase by almost 200 cases even if the the post-intervention period was longer? Surely an increase of 2 months between the two periods could not account for this.
2. Part of the intention of the program was directed at improving requirements for residents- no data is provided on this.
3. Lines 172 -178 addresses the barriers to TVH stated by attendings and later in Lines 190-198 some data is provided on the attendings on the barriers.. However this data seems to be the barriers to performing TVH before the program. Did these change in the post intervention period?
4. Lines 138-139 state 'The third tier was the implementation of a clinical pathway to assist in hysterectomy route decision making' Please comment on this important aspect
5. Residency requirements for training include not only Vaginal hysterectomies but other methods. What are the recommendations of the authors to ensure a balance of all types of hysterectomies for residency competency requirements? This is why the decision to perform one method or the other becomes important
6. Did residents meet their requirements for TVH? Were they satisfied?

Reviewer #3: The authors present a retrospective study examining route of hysterectomy at their hospital before (n=253) and after (n=445) instituting a multi-tier intervention aimed at increasing the number of procedures performed vaginally. 5.5% of hysterectomies were vaginal in the earlier cohort, 26.5% in the later. Among women without prolapse the proportions were 0% and 6.8%.

Line 108 - There are absolute contraindications to performing vaginal hysterectomy for benign indications. The authors provide an algorithm in this paper, in fact, that routes to other modalities for hysterectomy based on size and anatomic access. If a patient has disease that requires abdominal exploration, or one cannot obtain adequate exposure, it is not safe to perform vaginal hysterectomy. Stage IV endometriosis with culdesac obliteration, for example, is an absolute contraindication to vaginal hysterectomy.

The authors describe tiers of intervention to promote vaginal hysterectomy at their institution, including a resident workshop, attending workshops, copies of an algorithm for hysterectomy mode posted in the OB/GYN work spaces, and a FPMRS surgical mentorship program. How often were these interventions repeated? Was time off to attend these sessions provided by the chair with pay? Are these done on an ongoing basis? What were the mechanics of the mentorship program? It's one thing to be available to discuss a case and think through the details. It is quite another to be readily available to assist on a routine basis. Given the very low hysterectomy volume of surgeons in this group, it would be highly advisable to have a more experienced surgeon present for all vaginal cases until proficiency is reached, which would presumably take years, and would not seem feasible in most practice settings.

Why was the post-intervention portion of the study retrospective instead of prospective?

Line 168 - Does SCH refer to laparotomies? Were laparoscopic supracervical hysterectomies performed?

Line 187 and throughout: Why were VH and LAVH included as a composite? Other than gaining some vaginal skill by practicing creating a colpotomy from below, there is no advantage to LAVH over TLH, and most would consider the former a slower, less-efficient procedure because one has to move back and forth between an abdominal and vaginal prep field. There is no value in combining LAVH and TVH in comparison to other minimally invasive techniques. Any potential advantage that VH has over other MIS approaches is not shared by LAVH (no abdominal incisions, lower cost, compared to laparoscopy).

Why were there so many more patients in the post-intervention cohort than pre-intervention (nearly double)? Were more surgeons added to the department? If so, did they have more experience with VH? Were they FPMRS-trained? Why was the pre-intervention cohort 24 months and the post 26 months? Was a power calculation performed to estimate the size of the cohort?

50% of patients were obese. It would be helpful to provide median and range in addition to mean and SD, and/or show proportions in categories of obesity in Table 1. Operating on a patient with a BMI of 50 kg/m<sup>2</sup> is significantly more difficult than someone with a BMI of 30.

Line 203 - Did "abdominal surgery" include both laparoscopy and laparotomy?

Line 207 - 250 grams is an arbitrary cut-off for billing purposes. It would be helpful to have proportions in categories of uterine weight in Table 1.

Line 220 - Regarding their logistic regression, what was the method for determining an appropriate number of variables to include in the model? How was it decided what stayed in the model? Was colinearity examined? Effect modification?

Line 225 - "Patients who underwent hysterectomy in the post-intervention cohort were more likely to have a shorter length of stay than those in the pre-intervention cohort." This seems like an awkward way to say LOS was shorter in the post-intervention cohort. Presumably this is just because fewer patients had laparotomies, and possibly because of incorporating some enhanced recovery principles over time.

Line 278 - "our results suggest that the majority of the vaginal hysterectomies were performed by urogynecologists." Were all the hysterectomies done for prolapse by urogynecologists? If so, then the paper really rests on the increase from 0% to 6.8% in VH done for conditions other than prolapse. That 6.8% represents only 23 cases over two years, presumably among a diversity of surgeons.

Line 316 - The first laparoscopic hysterectomy was done in 1989 and now the majority of hysterectomies are performed this way in the US. At what point should LH be considered "traditional"?

Much more information needs to be provided on surgical volume and which surgeons performed the surgeries, how often assistance from a high-volume surgeon was used, etc. The real interest of the paper rests with a potential increase in general OB/GYNs who were not performing VH pre-intervention to those that were independently and consistently performing VH post-intervention. Other factors like minor and major complications, conversion from VH to laparoscopy or laparotomy, surgery time, EBL, etc. must also be examined.

How was longevity of the intervention examined?

#### STATISTICAL EDITOR COMMENTS:

The Statistical Editor makes the following points that need to be addressed:

Table 1: Need to include measures of variability (SD, IQR or ranges as appropriate) for uterine wgt, EBL, LOH

Similar to Table 1, Authors need to elaborate the type of surgery and all outcomes of interest vs relevant "predictors" such as race, parity, uterine wgt etc (lines 220-221).

Fig 2: Should round the %s in the vertical axis to nearest 0.1%, not to 0.01% precision.

Should include a brief Table listing the various tiers with explanation.

lines 212-225: Need to elaborate and summarize in Table format, the unadjusted and adjusted ORs with CIs for the relevant comparisons.

#### EDITOR COMMENTS:

1. The Editors of Obstetrics & Gynecology are seeking to increase transparency around its peer-review process, in line with efforts to do so in international biomedical peer review publishing. If your article is accepted, we will be posting this revision letter as supplemental digital content to the published article online. Additionally, unless you choose to opt out, we will also be including your point-by-point response to the revision letter. If you opt out of including your response, only the revision letter will be posted. Please reply to this letter with one of two responses:

- A. OPT-IN: Yes, please publish my point-by-point response letter.
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2. Obstetrics & Gynecology uses an "electronic Copyright Transfer Agreement" (eCTA). When you are ready to revise your manuscript, you will be prompted in Editorial Manager (EM) to click on "Revise Submission." Doing so will launch the resubmission process, and you will be walked through the various questions that comprise the eCTA. Each of your

coauthors will receive an email from the system requesting that they review and electronically sign the eCTA.

Please check with your coauthors to confirm that the disclosures listed in their eCTA forms are correctly disclosed on the manuscript's title page.

3. For studies that report on the topic of race or include it as a variable, authors must provide an explanation in the manuscript of who classified individuals' race, ethnicity, or both, the classifications used, and whether the options were defined by the investigator or the participant. In addition, the reasons that race/ethnicity were assessed in the study also should be described (eg, in the Methods section and/or in table footnotes). Race/ethnicity must have been collected in a formal or validated way. If it was not, it should be omitted. Authors must enumerate all missing data regarding race and ethnicity as in some cases, missing data may comprise a high enough proportion that it compromises statistical precision and bias of analyses by race.

Use "Black" and "White" (capitalized) when used to refer to racial categories. The nonspecific category of "Other" is a convenience grouping/label that should be avoided, unless it was a prespecified formal category in a database or research instrument. If you use "Other" in your study, please add detail to the manuscript to describe which patients were included in that category.

4. Standard obstetric and gynecology data definitions have been developed through the reVITALize initiative, which was convened by the American College of Obstetricians and Gynecologists and the members of the Women's Health Registry Alliance. Obstetrics & Gynecology has adopted the use of the reVITALize definitions. Please access the obstetric data definitions at <https://www.acog.org/practice-management/health-it-and-clinical-informatics/revitalize-obstetrics-data-definitions> and the gynecology data definitions at <https://www.acog.org/practice-management/health-it-and-clinical-informatics/revitalize-gynecology-data-definitions>. If use of the reVITALize definitions is problematic, please discuss this in your point-by-point response to this letter.

5. Because of space limitations, it is important that your revised manuscript adhere to the following length restrictions by manuscript type: Original Research reports should not exceed 22 typed, double-spaced pages (5,500 words). Stated page limits include all numbered pages in a manuscript (i.e., title page, précis, abstract, text, references, tables, boxes, figure legends, and print appendixes) but exclude references.

6. Specific rules govern the use of acknowledgments in the journal. Please note the following guidelines:

- \* All financial support of the study must be acknowledged.
- \* Any and all manuscript preparation assistance, including but not limited to topic development, data collection, analysis, writing, or editorial assistance, must be disclosed in the acknowledgments. Such acknowledgments must identify the entities that provided and paid for this assistance, whether directly or indirectly.
- \* All persons who contributed to the work reported in the manuscript, but not sufficiently to be authors, must be acknowledged. Written permission must be obtained from all individuals named in the acknowledgments, as readers may infer their endorsement of the data and conclusions. Please note that your response in the journal's electronic author form verifies that permission has been obtained from all named persons.
- \* If all or part of the paper was presented at the Annual Clinical and Scientific Meeting of the American College of Obstetricians and Gynecologists or at any other organizational meeting, that presentation should be noted (include the exact dates and location of the meeting).

7. The most common deficiency in revised manuscripts involves the abstract. Be sure there are no inconsistencies between the Abstract and the manuscript, and that the Abstract has a clear conclusion statement based on the results found in the paper. Make sure that the abstract does not contain information that does not appear in the body text. If you submit a revision, please check the abstract carefully.

In addition, the abstract length should follow journal guidelines. The word limit for Original Research articles is 300 words. Please provide a word count.

8. Only standard abbreviations and acronyms are allowed. A selected list is available online at <http://edmgr.ovid.com/ong/accounts/abbreviations.pdf>. Abbreviations and acronyms cannot be used in the title or précis. Abbreviations and acronyms must be spelled out the first time they are used in the abstract and again in the body of the manuscript.

9. The journal does not use the virgule symbol (/) in sentences with words. Please rephrase your text to avoid using "and/or," or similar constructions throughout the text. You may retain this symbol if you are using it to express data or a measurement.

10. In your Abstract, manuscript Results sections, and tables, the preferred citation should be in terms of an effect size, such as odds ratio or relative risk or the mean difference of a variable between two groups, expressed with appropriate confidence intervals. When such syntax is used, the P value has only secondary importance and often can be omitted or noted as footnotes in a Table format. Putting the results in the form of an effect size makes the result of the statistical test more clinically relevant and gives better context than citing P values alone.

If appropriate, please include number needed to treat for benefits (NNTb) or harm (NNTh). When comparing two

procedures, please express the outcome of the comparison in U.S. dollar amounts.

Please standardize the presentation of your data throughout the manuscript submission. For P values, do not exceed three decimal places (for example, "P = .001"). For percentages, do not exceed one decimal place (for example, 11.1%).

11. Please review the journal's Table Checklist to make sure that your tables conform to journal style. The Table Checklist is available online here: [http://edmgr.ovid.com/ong/accounts/table\\_checklist.pdf](http://edmgr.ovid.com/ong/accounts/table_checklist.pdf).

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In addition, the American College of Obstetricians and Gynecologists' (ACOG) documents are frequently updated. These documents may be withdrawn and replaced with newer, revised versions. If you cite ACOG documents in your manuscript, be sure the reference you are citing is still current and available. If the reference you are citing has been updated (ie, replaced by a newer version), please ensure that the new version supports whatever statement you are making in your manuscript and then update your reference list accordingly (exceptions could include manuscripts that address items of historical interest). If the reference you are citing has been withdrawn with no clear replacement, please contact the editorial office for assistance ([obgyn@greenjournal.org](mailto:obgyn@greenjournal.org)). In most cases, if an ACOG document has been withdrawn, it should not be referenced in your manuscript (exceptions could include manuscripts that address items of historical interest). All ACOG documents (eg, Committee Opinions and Practice Bulletins) may be found at the Clinical Guidance page at <https://www.acog.org/clinical> (click on "Clinical Guidance" at the top).

13. Figures 1-2: Please upload as figure files on Editorial Manager.

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If you choose to revise your manuscript, please submit your revision through Editorial Manager at <http://ong.editorialmanager.com>. Your manuscript should be uploaded in a word processing format such as Microsoft Word. Your revision's cover letter should include the following:

- \* A confirmation that you have read the Instructions for Authors (<http://edmgr.ovid.com/ong/accounts/authors.pdf>), and
- \* A point-by-point response to each of the received comments in this letter. Do not omit your responses to the Editorial Office or Editors' comments.

If you submit a revision, we will assume that it has been developed in consultation with your co-authors and that each author has given approval to the final form of the revision.

Again, your paper will be maintained in active status for 21 days from the date of this letter. If we have not heard from you by Dec 31, 2020, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,

Dwight J. Rouse, MD, MSPH

2019 IMPACT FACTOR: 5.524

2019 IMPACT FACTOR RANKING: 6th out of 82 ob/gyn journals

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In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: <https://www.editorialmanager.com/ong/login.asp?a=r>). Please contact the publication office if you have any questions.

Dear Editors of *Obstetrics and Gynecology*,

I am writing to submit our revisions for the manuscript entitled, “Vaginal Hysterectomy Rates Before and After Implementation of a Multi-Tier Intervention,” for consideration for publication in your journal. I have read the Instructions for Authors, as well as all of the thoughtful feedback and I have provided the appropriate edits and/or responses. We continue to believe that our study would be a great fit for this journal, and look forward to your review of our revisions.

I wanted to let the reviewers/editors know that the revised manuscript word document I have attached has line numbers that match up with my responses to their comments. When the PDF was built, those line numbers do not match. The word document with the tracked changes option "all markup" is the only view that correctly maintains the line numbers. From reading about this it is because of the tracked changes function (line numbers skip after each page when that function is being utilized). Please let me know if there is anything I can do to clarify any of our edits.

This manuscript describes original work and is not under consideration by any other journal. This project was presented orally at the virtually held *American Urogynecologic Society PDF Week* meeting on October 10, 2020. IRB approval through Cooper University Health Care was obtained (IRB number 20-380). All authors approved the manuscript and this submission, and agree that the manuscript will not be submitted elsewhere until a final decision is made by the Editors of *Obstetrics and Gynecology*.

I, Tess Couss, the lead author, affirm that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

Thank you for receiving our manuscript and considering it for review. We appreciate your time and look forward to your response.

Kind regards,

Tess Couss, MD



Reviewer #1:

Response to comment 2:

- Faculty members who utilized the mentorship program were all obstetrician gynecologists (9 in total) in 16 vaginal hysterectomy cases. The program is still on-going, and is designed to be dynamic as the surgeons' goals and skills change. Therefore, while no one has officially “graduated” from the program, their utilization of the program continues to shift as they meet their goals. We did not directly study the utilization of the



mentorship program, but anecdotally there are two main profiles: seasoned physicians who do not regularly perform TVH who are interested in brushing up their skillsets for difficult vaginal hysterectomies, and recently graduated physicians who are building up their surgical volumes and skillsets and hope to incorporate vaginal surgery. Seasoned physicians sought out less of a hands-on instruction and were more interested in learning the tricks for troubleshooting (ie vaginal morcellation of enlarged uteri), while the less-seasoned physicians were motivated to gain a more in-depth tutorial on performing TVH as an instructor for residents.

- In the manuscript we have clarified the utilization of the mentorship program (see lines: 546 to 565)

Response to comment 3:

- In the manuscript we have added more about the limitations/generalizability of the study (see lines: 902 to 911) and a description of the simulation work-shops (see lines: 222 to 252).

Reviewer #2:

- Response: This program was designed as a quality improvement project to increase vaginal hysterectomy surgical numbers at a teaching hospital. Much of its driving force was a need to increase graduating residents' vaginal hysterectomy numbers according to the ACGME requirements. The main goal of this particular research project was to study the program's effect on vaginal hysterectomy numbers. While data was collected prior to the program's initiation in order to identify barriers to performing vaginal hysterectomies, this data was used to develop the program itself, and was not the ultimate aim of this research project. Therefore, all of our information regarding decision making and barrier training outcomes for physicians is purely anecdotal.
1. Why did the number of hysterectomies in post-program increase by almost 200 cases even if the the post-intervention period was longer? Surely an increase of 2 months between the two periods could not account for this.

Response: The start of the program coincided with growth of the obstetrics and gynecology department. Two obstetrician/gynecologists and one FPMRS faculty member was added to the department at this time.

2. Part of the intention of the program was directed at improving requirements for residents- no data is provided on this.

Response: This has been added to the manuscript in lines: 644 to 650 and Table 5.

3. Lines 172 -178 addresses the barriers to TVH stated by attendings and later in Lines 190-198 some data is provided on the attendings on the barriers.. However this data seems to be the barriers to performing TVH before the program. Did these change in the post intervention period?



Response: The overall program was a quality improvement project. While data was collected prior to the program's initiation in order to identify barriers to performing vaginal hysterectomies, this data was used to develop the program itself, and was not the ultimate aim of this research project. The main goal of this particular research project was to study the program's effect on vaginal hysterectomy numbers. Therefore, we can only informally comment on our experience over the last 2 years.

Anecdotally we saw that many of the faculty who utilized the mentorship program were interested in learning tricks and skills to improve visualization and efficiency during the surgery. More seasoned surgeons were particularly interested in learning tricks for difficult vaginal hysterectomies, such as those requiring vaginal morcellation. Less seasoned surgeons who were still focused on building their surgical skillsets seemed to benefit from a more hands-on tutorial on how best to perform a vaginal hysterectomy as a teaching instructor to residents. All faculty members were able to perform independent vaginal hysterectomies, but appreciated the support given by the presence of a urogynecologist.

4. Lines 138-139 state 'The third tier was the implementation of a clinical pathway to assist in hysterectomy route decision making' Please comment on this important aspect

Response: This has been added to the manuscript in lines: 255 to 262.

5. Residency requirements for training include not only Vaginal hysterectomies but other methods. What are the recommendations of the authors to ensure a balance of all types of hysterectomies for residency competency requirements? This is why the decision to perform one method or the other becomes important.

Response: Thank you for this great point. Achieving a well-balanced surgical training for residents is certainly our ultimate goal. This project started as a quality improvement program for a teaching hospital to increase resident vaginal hysterectomy numbers in 2017. Prior to the program's initiation there was a concerning trend toward decreasing vaginal hysterectomy numbers in the graduating residents (see added Table 5). We worked with the obstetrics and gynecology department, and in particular the program director, to design a program that would not limit one particular method of surgical training, but one that would enhance training in an area that there was a clear dearth of training at the time. That being said, we recognize that it is our responsibility to actively reassess our goals and outcomes in order to prevent an uneven surgical training experience. This is done regularly at division meetings. We do believe that the core components of this program can be applied to deficiencies in any area of training.

6. Did residents meet their requirements for TVH? Were they satisfied?

Response: This has been added to the manuscript in lines: 644 to 650 and Table 5. Anecdotally, they are satisfied but this data was not collected.

Reviewer #3:

1. Line 108 - There are absolute contraindications to performing vaginal hysterectomy for benign indications. The authors provide an algorithm in this paper, in fact, that routes to other modalities for hysterectomy based on size and anatomic access. If a patient has disease that requires abdominal exploration, or one cannot obtain adequate exposure, it is not safe to perform vaginal hysterectomy. Stage IV endometriosis with culdesac obliteration, for example, is an absolute contraindication to vaginal hysterectomy.

Response: I have changed this wording in lines: 144 to 147.

2. The authors describe tiers of intervention to promote vaginal hysterectomy at their institution, including a resident workshop, attending workshops, copies of an algorithm for hysterectomy mode posted in the OB/GYN work spaces, and a FPMRS surgical mentorship program. How often were these interventions repeated? Was time off to attend these sessions provided by the chair with pay? Are these done on an ongoing basis? What were the mechanics of the mentorship program? It's one thing to be available to discuss a case and think through the details. It is quite another to be readily available to assist on a routine basis. Given the very low hysterectomy volume of surgeons in this group, it would be highly advisable to have a more experienced surgeon present for all vaginal cases until proficiency is reached, which would presumably take years, and would not seem feasible in most practice settings.

Response: This is a great point. We have found that the mentorship program self-selects for those who are interested in building their surgical skill-sets and this tends to apply to our higher volume surgeons and our less seasoned surgeons who hope to achieve a higher surgical volume. The mentorship program is one portion of our larger quality improvement project to increase vaginal hysterectomy rates. Our goal is to change the overall culture of the obstetrics and gynecology department regarding vaginal hysterectomies. All the individual aspects of our program seek to do that, and combined we have noticed comfortability with vaginal hysterectomies is improving. While we agree that it is not feasible to train an entire department to be proficient in vaginal hysterectomies, we have seen meaningful change in individuals who have repetitively utilized the mentorship program (see added lines about utilization: 546 to 565). We view this program as a resource best suited for motivated individuals who want to increase their vaginal surgery proficiency, and we have seen that it self-selects those individuals. We recognize the high variability in residency surgical training and are hoping to cultivate a culture that is ok with post-graduate surgical training.

Response: Regarding the interventions, simulation sessions continue to be repeated semi-annually. These are held during protected academic time. The mentorship program is an individualized program that tailors to the goals of the surgeon involved and adapts with the growth of the involved surgeon.

We have clarified this in the manuscript in lines: 220 to 245 and 263 to 376.

3. Why was the post-intervention portion of the study retrospective instead of prospective?  
Response: This program is a quality improvement program that is still ongoing. We decided it was important to retrospectively study the effects of the program now at the two-year mark to assess our progress.

4. Line 168 - Does SCH refer to laparotomies? Were laparoscopic supracervical hysterectomies performed?

Response: Abdominal hysterectomies refer to abdominal total or supracervical hysterectomies. We have changed the wording in the methods to explain this. See line 415.

5. Line 187 and throughout: Why were VH and LAVH included as a composite? Other than gaining some vaginal skill by practicing creating a colpotomy from below, there is no advantage to LAVH over TLH, and most would consider the former a slower, less-efficient procedure because one has to move back and forth between an abdominal and vaginal prep field. There is no value in combining LAVH and TVH in comparison to other minimally invasive techniques. Any potential advantage that VH has over other MIS approaches is not shared by LAVH (no abdominal incisions, lower cost, compared to laparoscopy).

Response: Vaginal hysterectomy and LAVH was included as a composite because we feel that LAVH training does contribute to overall vaginal hysterectomy proficiency. We have also noticed that many physicians view the LAVH as a stepping point to gain comfortability with vaginal hysterectomies because of the vaginal surgical experience it provides. Therefore, this was mostly included because we feel it adds valuable surgical education toward our ultimate goal of increasing vaginal hysterectomy rates.

We have addressed this in lines 772 to 784.

6. Why were there so many more patients in the post-intervention cohort than pre-intervention (nearly double)? Were more surgeons added to the department? If so, did they have more experience with VH? Were they FPMRS-trained? Why was the pre-intervention cohort 24 months and the post 26 months? Was a power calculation performed to estimate the size of the cohort?

Response: The start of the quality improvement program coincided with growth of the obstetrics and gynecology department. Two obstetrician/gynecologists and one FPMRS faculty member was added to the department at this time. A post hoc power calculation was not performed retrospectively because of the fact that we found significant findings, per recommendation of our statistician.

7. 50% of patients were obese. It would be helpful to provide median and range in addition to mean and SD, and/or show proportions in categories of obesity in Table 1. Operating on a patient with a BMI of 50 kg/m<sup>2</sup> is significantly more difficult than someone with a BMI of 30.

Response: This was added to Table 2 (the previous Table 1).

8. Line 203 - Did "abdominal surgery" include both laparoscopy and laparotomy?

Response: Yes it did, we have clarified this in line 414.

9. Line 207 - 250 grams is an arbitrary cut-off for billing purposes. It would be helpful to have proportions in categories of uterine weight in Table 1.

Response: This was added to Table 2 (previously Table 1).

10. Line 220 - Regarding their logistic regression, what was the method for determining an appropriate number of variables to include in the model? How was it decided what stayed in the model? Was colinearity examined? Effect modification?

Response: The method was based on analyzing the variables of interest.

Colinearity and effect modification were not examined. Only variables that existed prior to surgery were included in the model as opposed to variables such as length of hospitalization.

11. Line 225 - "Patients who underwent hysterectomy in the post-intervention cohort were more likely to have a shorter length of stay than those in the pre-intervention cohort." This seems like an awkward way to say LOS was shorter in the post-intervention cohort. Presumably this is just because fewer patients had laparotomies, and possibly because of incorporating some enhanced recovery principles over time.

Response: The wording has been changed in the manuscript. Length of hospitalization was shorter in the post-intervention cohort compared to the pre-intervention cohort.

See line 642.

12. Line 278 - "our results suggest that the majority of the vaginal hysterectomies were performed by urogynecologists." Were all the hysterectomies done for prolapse by urogynecologists? If so, then the paper really rests on the increase from 0% to 6.8% in VH done for conditions other than prolapse. That 6.8% represents only 23 cases over two years, presumably among a diversity of surgeons.

Response: That is a great point that we did attempt to show by reporting both prolapse and non-prolapse associated vaginal hysterectomies. Despite a seemingly small change, we do feel it was very significant change to increase from the prior 0% vaginal hysterectomy rate. Even 23 additional hysterectomies per two years helps us to achieve a higher rate of minimally invasive surgery and improved graduating resident TVH numbers. We do recognize that the non-prolapse associated vaginal hysterectomy can be significantly more challenging than the prolapse-associated vaginal hysterectomy, which is why this small increase is still very important in our opinion. Although, one can argue the simpler solution to our program of training vaginal hysterectomies would be to just hire more urogynecologists, we need to acknowledge the fact that there is a significant trend for uterine preservation surgery with prolapse repair – hysteropexies are on the rise and it is unknown how this will affect vaginal hysterectomy numbers for trainees. Hence we believe even the modest increase of TVHs in the generalist's practice is a big/noticeable achievement.

13. Line 316 - The first laparoscopic hysterectomy was done in 1989 and now the majority of hysterectomies are performed this way in the US. At what point should LH be considered "traditional"?

Response: This is a great point and we have changed the wording.

See line: 896.

14. Much more information needs to be provided on surgical volume and which surgeons performed the surgeries, how often assistance from a high-volume surgeon was used, etc. The real interest of the paper rests with a potential increase in general OB/GYNs who were not performing VH pre-intervention to those that were independently and consistently performing VH post-intervention. Other factors like minor and major complications, conversion from VH to laparoscopy or laparotomy, surgery time, EBL, etc. must also be examined.

How was longevity of the intervention examined?

This are great points. The aim of this research study was to assess the effect of the program on vaginal hysterectomy rates at a teaching institution. While we did collect data on physician and resident vaginal hysterectomy barriers and experience during the design phase of the quality improvement project, we did not study these variables throughout the program and therefore can only speak anecdotally on this subject.

The mentorship program, while important, was only one aspect of the overall program. We have found that the mentorship program particularly evoked interest from two main groups of surgeons (seasoned surgeons in practice several year vs. new graduates in practice less than 3 year. Both groups it attracted were either high volume surgeons or desired to become higher volume surgeons. There has been no decrease in interest in the program since its initiation, and utilization of the mentorship program increased from 6 cases in 2018 and 12 in 2019 (see added lines 546 to 565 about utilization of mentorship program).

We have noticed that surgeons who repetitively utilize the program have had a significant change in comfort and proficiency of performing hysterectomy . At this relatively early point in our program, we did not feel comfortable reporting on the results of the mentorship portion of the program specifically because there is not enough data yet. We aim to continue the program with regular reassessments of progress, development of new deficiencies, and attitudes of the participants and hope to present longer-term results in the future.

Statistical editor comments:

1. Table 1: Response: Measures of variability have been added to Table 2 (previously Table 1).
2. Authors need to elaborate the type of surgery and all outcomes of interest vs relevant "predictors" such as race, parity, uterine wgt etc (lines 220-221).  
Response: This was elaborated on and the ORs were added. See Tables 2, 3 and 4.
3. Figure 2: Response: The % precision was corrected.
4. Response: A new table (the new Table 1) was added to list the various tiers.

5. lines 212-225: Need to elaborate and summarize in Table format, the unadjusted and adjusted ORs with CIs for the relevant comparisons.

Response: This was done with the addition of Table 4.

Editor Comments:

1. Opt-In: Yes, please publish my point-by-point response letter.
2. Emails were confirmed to be correct for co-authors.
3. Race: This was clarified in the methods and results sections, and in Table 2. Race was abstracted from electronic medical records for which patients self-identify their race from several options. Missing data was enumerated in Table 2.
4. reVITALize: This was reviewed and our manuscript is in agreement.
5. Original Research reports should not exceed 22 typed, double-spaced pages (5,500 words). Stated page limits include all numbered pages in a manuscript (i.e., title page, précis, abstract, text, references, tables, boxes, figure legends, and print appendixes) but exclude references.

Response: Manuscript word count excluding references is 4731 and length is 22 pages. Abstract word count is 238.

6. We have noted the prior presentation of this work on the title page.
7. The abstract has been updated and is 238 words.
8. Abbreviations have been removed unless in the standard list provided.
9. The virgule symbol has been removed.
10. Effect size has been added to the abstract, results and tables as requested.
11. Decimal places have been limited to 3 decimal places.
12. The Table Checklist has been reviewed.
13. The reference style has been reviewed.
14. Figures 1 and 2 have been uploaded as figure files on Editorial Manager.
15. Not applicable