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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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Questions about these materials may be directed to the Obstetrics & Gynecology editorial office:

obgyn@greenjournal.org.
RE: Manuscript Number ONG-19-865

Decreasing opioid use intrapartum; a quality improvement initiative

Dear Dr. Rogers:

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 Jun 28, 2019, we will assume you wish to withdraw the manuscript from further consideration.

REVIEWER COMMENTS:

Reviewer #1: These authors present a retrospective cohort study examining opioid use during the inpatient stay following delivery prior to and following an intervention aimed at reducing prescribing and utilization of opioids. The intervention consisted of redefining adequacy of pain based on function goals as opposed to a pain score and on development of standard order sets. They found that the intervention reduced opioid prescribing and total MMEs but that the reported adequacy of pain control was decreased.

1. The description of the study design and intervention in the abstract is difficult to understand. It should be reworded to allow the reader to more readily understand exactly what was done.

2. What is meant by "lower rates of acceptable pain"? Does this mean there were higher rates of acceptable pain?

3. It is unclear from the description of the components of the plan, exactly what the third component is that is different from the first and second components. Overall, the description of the preintervention management and post intervention is difficult to understand from the methods section. Since this is a retrospective cohort study comparing pre- and post-intervention, it is important to be able to clearly understand typical management prior to the intervention as well as the management outlined in the new order set modifications. The details of the order set and the tiered plan should be included in the manuscript.

4. On line 119, it states "if the patient's reported pain intensity was ever at or below the reported scale..." they were considered to have maintained an acceptable pain level. What if they had only a single report that was below that level in a 24 hour period? Were they still considered maintained? It would seem that to "maintained" there ought to be a threshold that at least 50%, and perhaps more, of the time that the pain control should be acceptable to be considered maintained.

5. Since the question on CGCAHPS relates to was pain "well-controlled" did the authors do any type of analysis to compare patient determination of "well-controlled" versus their determination of an acceptable degree of pain control?

6. The authors incorporated statistical modeling to account for any changes in opioid prescribing practices before or after the intervention. Was there something done prior that could have changed the prescribing practices?

7. The conveyance of the reduction in opioid prescription via an OR that is >1 is somewhat counterintuitive. It would seem more logical to flip the OR the other way around and would more readily convey the goal of the intervention.

8. Figures 2 and 3 do not add to the manuscript meaningfully in their current form.
9. In the results section there is a description of how opioid prescribing changed over the 12 months following the intervention, but this is somewhat confusing. This may be better represented graphically, as the text does not seem to adequately describe the full extent of the changes. Additionally, the data should be presented somewhere in a table or more fully included in the text.

10. In line 228, the authors state "In follow-on analyses (data not shown), we found with adjustment for MME prescription, that shifts in acetaminophen and acceptable pain were not accounted for by the change in MME use after versus before order set implementation." What exactly is meant by this? In addition, if the authors are going to make conclusions like this the data should be presented.

11. Were cautions put into place that could prevent excess acetaminophen intake?

Reviewer #2: The authors present a retrospective cohort study looking at the impact of a standardized postpartum quality improvement project with the goal to decrease opioid prescribing. The order sets for pain focused on therapeutic postpartum activity instead of pain scores. The primary outcomes evaluated were the categorical use of narcotics and MMEs in those that did for uncomplicated vaginal deliveries and cesarean sections. Secondary outcomes included acetaminophen use > 4gm in 24 hours and pain scores that were acceptable pre and post implementation. This is a great example of QI projects changing both outcomes and clinical practice.

Introduction:
Concise and relevant overview leading into the objective of this study. Please expand on general use of ERAS and whether this was occurring at your institutions for obstetric patients to any degree.

Materials and methods:
1. Line 146 Was the secondary outcome meant to be 4mg or 4gm? The 24 hour max is 4 gm as listed in table 2.

Results:
Table 1

2. Although the numbers were small why were patients with Alcohol abuse included. They are more likely to have other substance abuse disorders and this itself would also qualify. Was it meant to evaluate alcohol and Tabaco use? Please clarify.

3. The difference in parity is interesting and would suggest a potential greater effect or reduction since most of these patients were unlikely to be narcotic naive. Although there may be no way to evaluate narcotic naive patients with the coding, an interesting sub analysis could be on nulliparous patients as a proxy before and after implementation.

Table 2

4. Is there further breakdown by indications for cesarean section and vaginal delivery on opioid use? Ie where was the greatest impact arrest of labor, repeat cesarean sections etc. Or 1st - 4th degree laceration differences for vaginal deliveries.

Discussion:
5. Line 222-223 The wording of no opioid use increasing is confusing. Perhaps rephrase it to say there was a 5 fold decrease in the use of any opioids for pain.

6. Line 226-230 The 2nd outcome of acetaminophen over rx is interesting and relatively high and significantly different over this time period 7 to 8%. How are NSAIDs incorporated into the order sets on a scheduled or prn basis and is there an EMR alert to avoid over prescribing? Is there data on NSAID dosing pre and post intervention? Given the goal of decreasing opioid MME were MME in the tier 2 oral regiments rx as oxycodone or hydrocodone alone or in combination with acetaminophen?

7. Line 232-238 Was there any assessment of compliance or ability to bypass the ordersets?

8. The discussion and limitations are acknowledged. The patient education and expectations of postpartum pain management with functional goals may be even more profound than cited in the orthopedic literature given the mother's motivation and potential impact on the baby.
Reviewer #3: This is a well-written paper and highlights important issue. The sample size is large and the use of multiple hospitals is a plus. The authors appropriately address weaknesses/limitations of the study. Assessing opioid use after discharge from the hospital is key in evaluating the authors' initiative. I do have the following questions and comments which should be addressed prior to continuing to be considered for publication.

1. There should be more supporting information for lines 78-80.
2. What were the doses of ibuprofen administered?
3. When were narcotics given intravenously?
4. A diagram of the pain management order set would be of use to the reader.
5. How were nurses educated on the pain management order set?
6. How soon was pain level assessed after administration of medication?
7. Was the difference in opioid use before and after the initiative was consistent across all races?
8. What were the body mass indices of these patients?
9. What percentage of patients received opioids intravenously?
10. Was morphine administered intrathecally at time of placement of regional anesthesia?
11. What percentage of patients did not receive regional analgesia intrapartum? What did they receive instead?
12. What was the mean acceptable pain level scale?
13. Did all patients who underwent cesarean delivery have Pfannensteil incisions?
14. Did any of the patients who underwent cesarean receive any other pain management treatment other than regional analgesia/anesthesia (i.e. transabdominal plane block)?

STATISTICAL EDITOR'S COMMENTS:

1. Abstract: As space permits, suggest including more information re: absolute changes. eg. the odds of using no opioids decreased significantly, but what were the actual %s pre and post for the two delivery routes? Also, need to state that these were adjusted ORs, not crude ORs.

2. Table 1: Since LOS were compared using Wilcoxon stats test, should format LOS as median(IQR or range), rather than as mean(SD).

3. Table 3: For the logistic regression entries, should also include non-adjusted ORs for contrast. Could also consolidate the columns of main effect with CIs. Since the CIs are given, the p-values are somewhat redundant and could be indicated by footnotes.

4. Tables 2, 3 and lines 204-206, 214-216: Expressing "24hr acceptable pain" as either an adjusted odds or as "2.5 times lower" may be confusing for some readers. Again, should include unadjusted OR and include the more direct comparisons of proportion of women after CD or vaginal delivery who reported "acceptable pain levels" by 24 hours. Those proportions could be cited in table format as unadjusted and adjusted rates, if desired. That would seem to be more direct and relates to the apparent trade-off: generally less opioids, but more women received > 4 grams acetaminophen/24 hrs and fewer women had acceptable pain within 24 hours.

5. Just a suggestion, but perhaps the outcomes could be summarized as the "pros" and the "cons", with clear differences, such as "% receiving no opioids", "MME used" vs "> 4g acetaminophen/24 hrs" and metrics of % not achieving acceptable pain in a summary table.

EDITORIAL OFFICE 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.
B. OPT-OUT: No, please do not publish my point-by-point response letter.

2. As of December 17, 2018, Obstetrics & Gynecology has implemented an "electronic Copyright Transfer Agreement" (eCTA) and will no longer be collecting author agreement forms. 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.

Any author agreement forms previously submitted will be superseded by the eCTA. During the resubmission process, you are welcome to remove these PDFs from EM. However, if you prefer, we can remove them for you after submission.

3. Responsible reporting of research studies, which includes a complete, transparent, accurate and timely account of what was done and what was found during a research study, is an integral part of good research and publication practice and not an optional extra. Obstetrics & Gynecology supports initiatives aimed at improving the reporting of health research, and we ask authors to follow specific guidelines for reporting randomized controlled trials (ie, CONSORT), observational studies (ie, STROBE), meta-analyses and systematic reviews of randomized controlled trials (ie, PRISMA), harms in systematic reviews (ie, PRISMA for harms), studies of diagnostic accuracy (ie, STARD), meta-analyses and systematic reviews of observational studies (ie, MOOSE), economic evaluations of health interventions (ie, CHEERS), quality improvement in health care studies (ie, SQUIRE 2.0), and studies reporting results of Internet e-surveys (CHERRIES). Include the appropriate checklist for your manuscript type upon submission. Please write or insert the page numbers where each item appears in the margin of the checklist. Further information and links to the checklists are available at http://ong.editorialmanager.com. In your cover letter, be sure to indicate that you have followed the CONSORT, MOOSE, PRISMA, PRISMA for harms, STARD, STROBE, CHEERS, SQUIRE 2.0, or CHERRIES guidelines, as appropriate.

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 and gynecology data definitions at https://www.acog.org/About-ACOG/ACOG-Departments/Patient-Safety-and-Quality-Improvement/reVITALize. 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, 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 limits for different article types are as follows: Original Research articles, 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. Please review the journal's Table Checklist to make sure that your tables conform to journal style. The Table Checklist

11. Authors whose manuscripts have been accepted for publication have the option to pay an article processing charge and publish open access. With this choice, articles are made freely available online immediately upon publication. An information sheet is available at http://links.lww.com/LWW-ES/A48. The cost for publishing an article as open access can be found at http://edmgr.ovid.com/acd/accounts/ifauth.htm.

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If you choose to revise your manuscript, please submit your revision via Editorial Manager for Obstetrics & Gynecology at http://ong.editorialmanager.com. It is essential that your cover letter list point-by-point the changes made in response to each criticism. Also, please save and submit your manuscript in a word processing format such as Microsoft Word.

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 Jun 28, 2019, we will assume you wish to withdraw the manuscript from further consideration.

Sincerely,

The Editors of Obstetrics & Gynecology

2017 IMPACT FACTOR: 4.982
2017 IMPACT FACTOR RANKING: 5th out of 82 ob/gyn journals

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.
Introduction: We thank the reviewers for their suggestions and comments and believe that we have been responsive to each comment as outlined below. In the course of conducting our revisions, we found that 2 patients (0.01%) were included in the analyses who needed to be excluded in the current revision, and that a few variables had been misaligned in the original dataset. This has resulted in small but not statistically significant changes in some values in the results section.

Reviewer #1: These authors present a retrospective cohort study examining opioid use during the inpatient stay following delivery prior to and following an intervention aimed at reducing prescribing and utilization of opioids. The intervention consisted of redefining adequacy of pain based on function goals as opposed to a pain score and on development of standard order sets. They found that the intervention reduced opioid prescribing and total MMEs but that the reported adequacy of pain control was decreased.

1. The description of the study design and intervention in the abstract is difficult to understand. It should be reworded to allow the reader to more readily understand exactly what was done.
   RESPONSE: We have revised the abstract to better reflect practices prior to and following the intervention.

2. What is meant by "lower rates of acceptable pain"? Does this mean there were higher rates of acceptable pain?
   RESPONSE: We believe that the reviewer is referring to lines 65-66 and have changed the wording to make the meaning clearer to reflect that the number of women reporting acceptable pain levels declined pre and post intervention.

3. It is unclear from the description of the components of the plan, exactly what the third component is that is different from the first and second components. Overall, the description of the pre-intervention management and post intervention is difficult to understand from the methods section. Since this is a retrospective cohort study comparing pre- and post-intervention, it is important to be able to clearly understand typical management prior to the intervention as well as the management outlined in the new order set modifications. The details of the order set and the tiered plan should be included in the manuscript.
   RESPONSE: We have extensively revised the methods section to better characterize our intervention. We have also included a figure that contains the tiered order set and another figure that describes the therapeutic activity goals. The descriptions of the pre and post MPPP are more clearly separated in the manuscript.

4. On line 119, it states "if the patient’s reported pain intensity was ever at or below the reported scale..." they were considered to have maintained an acceptable pain level. What if they had only a single report that was below that level in a 24 hour period? Were they still considered maintained? It would seem that to "maintained" there ought to be a threshold that at least 50%, and perhaps more, of the time that the pain control should be acceptable to be considered maintained.
   RESPONSE: To clarify how we measured acceptable pain, patients were considered to have met their acceptable pain level if they ever achieved the pain level goal. We have changed
the wording throughout to reflect that the patients “achieved” rather than “maintained” acceptable pain levels.

5. Since the question on CGCAHPS relates to was pain "well-controlled" did the authors do any type of analysis to compare patient determination of "well-controlled" versus their determination of an acceptable degree of pain control?
   RESPONSE: We have performed correlation analyses to compare HCAHPS scores with the percentage of patients who achieved an acceptable pain score and found that the two measures to be not correlated. These two measures of pain measure completely different aspects of pain.

6. The authors incorporated statistical modeling to account for any changes in opioid prescribing practices before or after the intervention. Was there something done prior that could have changed the prescribing practices?
   RESPONSE: We are not aware of any major changes in care that preceded initiation of the order sets and the training of the care team. We have acknowledged that there may be biases that we do not have data for that may account for some of the differences observed. We have added a statement in the discussion to this effect.

7. The conveyance of the reduction in opioid prescription via an OR that is >1 is somewhat counterintuitive. It would seem more logical to flip the OR the other way around and would more readily convey the goal of the intervention.
   RESPONSE: For binary opioid prescription, the measure’s direction has been reversed to reflect a reduction in opioid prescription rather than an increase in “no opioid prescription”. In addition, and more importantly, we have updated analyses of all binary endpoints (opioid prescription, acceptable pain, or acetaminophen use) to be in terms of risk and risk ratios rather than odds and odds ratios.

8. Figures 2 and 3 do not add to the manuscript meaningfully in their current form.
   RESPONSE: We thank the reviewer for this comment but feel that a graphical representation of the data is important. We have added text to figure legends to better explain what is illustrated in the figures; we are happy to delete or revise further if needed.

9. In the results section there is a description of how opioid prescribing changed over the 12 months following the intervention, but this is somewhat confusing. This may be better represented graphically, as the text does not seem to adequately describe the full extent of the changes. Additionally, the data should be presented somewhere in a table or more fully included in the text.
   RESPONSE: In response, we have added text to more fully explain the graphical representation of our data in Figures 2 and 3, as well as reorganized and revised the information describing changes in opioid prescribing pre and post intervention to make our meaning clearer.

10. In line 228, the authors state "In follow-on analyses (data not shown), we found with adjustment for MME prescription, that shifts in acetaminophen and acceptable pain were not accounted for by the change in MME use after versus before order set implementation."
What exactly is meant by this? In addition, if the authors are going to make conclusions like this the data should be presented.
RESPONSE: We have now included the data and analysis in the last paragraph of the results section and clarified the association between MME, acetaminophen use and acceptable pain.

11. Were cautions put into place that could prevent excess acetaminophen intake?
RESPONSE: We have clarified cautions that were built into the MPPP to prevent excess acetaminophen intake.

Reviewer #2: The authors present a retrospective cohort study looking at the impact of a standardized postpartum quality improvement project with the goal to decrease opioid prescribing. The order sets for pain focused on therapeutic postpartum activity instead of pain scores. The primary outcomes evaluated were the categorical use of narcotics and MMEs in those that did for uncomplicated vaginal deliveries and cesarean sections. Secondary outcomes included acetaminophen use > 4gm in 24 hours and pain scores that were acceptable pre and post implementation. This is a great example of QI projects changing both outcomes and clinical practice.

Introduction:

1. Concise and relevant overview leading into the objective of this study. Please expand on general use of ERAS and whether this was occurring at your institutions for obstetric patients to any degree.
RESPONSE: Thank you for your positive comment about this study. We have not launched ERAS for our obstetrical or gynecologic patients during the study period.

Materials and methods:

2. Line 146 Was the secondary outcome meant to be 4mg or 4gm? The 24 hour max is 4 gm as listed in table 2.
RESPONSE: Thank you for finding this. This was a typographical error. We have changed the text to write 4 g.

Results:

Table 1

3. Although the numbers were small why were patients with Alcohol abuse included. They are more likely to have other substance abuse disorders and this itself would also qualify. Was it meant to evaluate alcohol and Tabaco use? Please clarify.
RESPONSE: We have modified the table to state “Alcohol use” rather than “alcohol abuse”. We have also modified the text to reflect that women who had an ICD 10 code for alcohol abuse were not eligible for participation.
4. The difference in parity is interesting and would suggest a potential greater effect or reduction since most of these patients were unlikely to be narcotic naïve. Although there may be no way to evaluate narcotic naïve patients with the coding, an interesting sub analysis could be on nulliparous patients as a proxy before and after implementation.

**RESPONSE:** We appreciate the reviewer’s comments and agree that it would be helpful to know which patients are opioid naïve versus those who have had prior exposure. While eliminating patients who have a history of substance abuse from these analyses does eliminate some of these patients, it is probable that a subset of patients have had exposure prior to their delivery. Unfortunately, we do not have data on who among the nulliparous (or parous) patients are opioid naïve. We agree that this would be an area of future research.

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**Table 2**

5. Is there further breakdown by indications for cesarean section and vaginal delivery on opioid use? I.e where was the greatest impact arrest of labor, repeat cesarean sections etc. Or 1st - 4th degree laceration differences for vaginal deliveries.

**RESPONSE:** Patients with repeat cesarean sections and 3/4th degree lacerations were included in our model. As denoted in Table 1, the percentage of women with severe lacerations was very low. While the number of women who underwent repeat cesarean section was higher, the numbers of women were similar between groups. Unfortunately, we are unable to determine what among the labor characteristics had the greatest impact on opioid use.

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**Discussion:**

6. Line 222-223 The wording of no opioid use increasing is confusing. Perhaps rephrase it to say there was a 5 fold decrease in the use of any opioids for pain.

**RESPONSE:** We have made the suggested change.

7. Line 226-230 The 2nd outcome of acetaminophen over rx is interesting and relatively high and significantly different over this time period 7 to 8%. How are NSAIDs incorporated into the order sets on a scheduled or prn basis and is there an EMR alert to avoid over prescribing? Is there data on NSAID dosing pre and post intervention? Given the goal of decreasing opioid MME were MME in the tier 2 oral regiments rx as oxycodone or hydrocodone alone or in combination with acetaminophen?

**RESPONSE:** As answered above we did include an EMR alert to over-prescribing acetaminophen. In our intervention, NSAID administration is scheduled. We have added language to clarify the cautions in the MPPP. Pre intervention NSAIDs were provided for pain levels of 1-3 (on a 10-point scale). Post intervention the administration of NSAIDs was preselected, scheduled administration. In Tier 2, oxycodone and hydrocodone were prescribed separately and not in combination with acetaminophen. We have added language in the description of the intervention as well as in the discussion to clarify how the acetaminophen was administered.

8. Line 232-238 Was there any assessment of compliance or ability to bypass the ordersets?

**RESPONSE:** Unfortunately, we do not have data on compliance with the order sets. Nonetheless, we found significant changes in opioid use pre and post intervention and can assume that a significant portion of patients were cared for under the new MPPPs. In addition, the MPPP required that providers “opt-out” of utilization when admitting patients to labor and delivery which would increase compliance with the intervention.
9. The discussion and limitations are acknowledged. The patient education and expectations of postpartum pain management with functional goals may be even more profound than cited in the orthopedic literature given the mother's motivation and potential impact on the baby.
RESPONSE: Thanks for this comment.

Reviewer #3: This is a well-written paper and highlights and important issue. The sample size is large and the use of multiple hospitals is a plus. The authors appropriately address weaknesses/limitations of the study. Assessing opioid use after discharge from the hospital is key in evaluating the authors' initiative. I do have the following questions and comments which should be addressed prior to continuing to be considered for publication.

1. There should be more supporting information for lines 78-80.
RESPONSE: We have added two references regarding the risk of long term abuse in opioid naïve patients.

2. What were the doses of ibuprofen administered?
RESPONSE: 600 milligrams of Ibuprofen was administered every six hours. This information has been added to the manuscript within the order set summary.

3. When were narcotics given intravenously?
RESPONSE: Prior to the intervention, a 10-point scale was used to rate pain; pain levels greater than 3 received narcotics. IV narcotics were given when patients were unable to tolerate PO medications or when PO medications were contraindicated such as during surgery.

4. A diagram of the pain management order set would be of use to the reader.
RESPONSE: We have included a figure with the order set.

5. How were nurses educated on the pain management order set?
RESPONSE: Nurses were educated about the MPPP via live classroom with an instructor. The unit educators were responsible for reinforcing content with the nurses face-to-face. We have added this to the description of our intervention in the Methods section.

6. How soon was pain level assessed after administration of medication?
RESPONSE: It is standard of practice in our unit to recheck pain levels one hour after administering medication for pain. This is a Joint Commission standard and did not change pre to post intervention.

7. Was the difference in opioid use before and after the initiative was consistent across all races?
RESPONSE: There are not enough people in the non-white racial groups to reliably test differences between racial groups.

8. What were the body mass indices of these patients?
RESPONSE: Unfortunately, BMI at admission is missing for approximately 20% of patients. We do have more reliable data on the numbers of patients who had an obesity diagnosis and have included those data in Table 1.
9. What percentage of patients received opioids intravenously?
RESPONSE: We have added these data to Table 2.

10. Was morphine administered intrathecally at time of placement of regional anesthesia?
RESPONSE: Yes, they were administered Duromorph for regional anesthesia and this was
included in the total MME calculations.

11. What percentage of patients did not receive regional analgesia intrapartum? What did they
receive instead?
RESPONSE: As illustrated in Table 1, two thirds of our patients received regional anesthesia.
Women who did not have a regional anesthetic receive IV fentanyl or nothing. This practice
did not change pre to post intervention since women on the labor floor were NPO.

12. What was the mean acceptable pain level scale?
RESPONSE: As indicated above, the acceptable pain level measurements refer to whether or
not the patient achieved their therapeutic pain goal. We have altered the manuscript to
clarify this throughout.

13. Did all patients who underwent cesarean delivery have Pfannensteil incisions?
RESPONSE: We do not have data regarding how many women had vertical incisions,
however it is rare on our unit to perform vertical incisions. A vertical incision would be
performed in the case of an emergency cesarean or in the case where the patient had had a
prior vertical incision.

14. Did any of the patients who underwent cesarean receive any other pain management
treatment other than regional analgesia/anesthesia (i.e. transabdominal plane block)?
RESPONSE: It is not our practice to offer patients TAP blocks on labor and delivery.

STATISTICAL EDITOR'S COMMENTS:

1. Abstract: As space permits, suggest including more information re: absolute changes. eg. the
odds of using no opioids decreased significantly, but what were the actual %s pre and post for
the two delivery routes? Also, need to state that these were adjusted ORs, not crude ORs.
RESPONSE: We have reported percentage changes as requested and indicated that the odds
ratios are adjusted.

2. Table 1: Since LOS were compared using Wilcoxon stats test, should format LOS as median(IQR
or range), rather than as mean(SD).
RESPONSE: Table 1 has been modified to reflect the change. LOS now contains 25th, 50th, and
75th percentile.

3. Table 3: For the logistic regression entries, should also include non-adjusted ORs for contrast.
Could also consolidate the columns of main effect with CIs. Since the CIs are given, the p-values
are somewhat redundant and could be indicated by footnotes.
RESPONSE: Log-linear regression was used in place of logistic regression to enhance clarity of model results. Unadjusted risk ratios accounting only for treatment effect and time were added to Table 3 and confidence intervals (rather than p-values) are placed beside point estimates to convey statistical significance.

4. Tables 2, 3 and lines 204-206, 214-216: Expressing "24hr acceptable pain" as either an adjusted odds or as "2.5 times lower" may be confusing for some readers. Again, should include unadjusted OR and include the more direct comparisons of proportion of women after CD or vaginal delivery who reported "acceptable pain levels" by 24 hours. Those proportions could be cited in table format as unadjusted and adjusted rates, if desired. That would seem to be more direct and relates to the apparent trade-off: generally less opioids, but more women received > 4 grams acetaminophen/24 hrs and fewer women had acceptable pain within 24 hours. RESPONSE: The direction and measure of association have been amended. See above comment response.

5. Just a suggestion, but perhaps the outcomes could be summarized as the "pros" and the "cons", with clear differences, such as "% receiving no opioids", "MME used" vs "> 4g acetaminophen/24 hrs" and metrics of % not achieving acceptable pain in a summary table. RESPONSE: We have clarified the number of patients in both the figures and the tables who did not receive any opioids, MME used, as well as the percent who used over 4g acetaminophen and those without acceptable pain control.

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