Peer Review File

Article information: https://dx.doi.org/10.21037/tau-23-400

Reviewer A

1. Line 117: Vasectomy is one of the most common, safe, and effective methods of contraception (1). (The statement should consider adding "in men" after "methods of contraception" for clarity.)

   We have made the suggested edit. The text now reads: “Vasectomy is one of the most common, safe, and cost-effective methods of contraception in men, and continues to gain interest (1, 2, 3)” (pp. 4, 107-108)

2. Line 122: Abbreviations for copper-T IUD and LNG-20 IUD are not used either there or separately.

   Thank you for bringing this to our attention. The text now reads: “...compared to the copper intrauterine device (IUD) at $647 and levonorgestrel 20 mcg IUD at $930.” (pp. 4, 112-113)

3. Line 124: Aside from vasectomy, the only other widely used method of male contraception is condoms, (Consider: "The only other widely used male contraceptive method besides vasectomy is condoms," to improve flow.)

   We have made the suggested edit. The text now reads: “The only other widely used method of male contraception aside from vasectomy is condoms” (pp. 4, 115-116)

4. Line 127 Despite the clear advantages of vasectomy, the need for post-vasectomy semen analysis (PVSA) to confirm sterility creates opportunity for (Consider either changing to "potential issues with" or add an indefinite article “an” before opportunity) loss to follow-up due to patient non-compliance with the screening protocol.

   Thank you for this suggestion. The text now reads: “vasectomy is also the only contraceptive method that requires post-procedural diagnostic confirmation of sterility known as post-vasectomy semen analysis (PVSA), creating potential issues in patient non-compliance.” (pp. 4, 119-121)

5. Line 130: Compliance with inconvenient testing inherent to the vasectomy procedure. (Consider changing "the" to "a" here.)

   We agree and have incorporated this feedback as part of broader revisions to this sentence: “vasectomy is also the only contraceptive method that requires post-procedural diagnostic confirmation of sterility known as post-vasectomy semen analysis (PVSA), creating potential issues in patient non-compliance.” (pp. 4, 119-121)

6. Line 143 & 144: The vasectomy is considered to have failed if any motile sperm are seen on PVSA 6 months after the operation (write digit “6” in the letter “six” and provide the reference to justify this statement).

   We have revised the manuscript as recommended and cited a reference source for the statement: “vasectomy is considered to have failed if any motile sperm are seen on PVSA six months after the operation (6).” (pp. 5, 139-140)

   (6) Sharlip ID, Belker AM, Honig S et al: Vasectomy: AUA guideline. J Urol 2012; 188: 2482.

7. Line 152: Patients in the study cited distance, time constraints, and forgetfulness as primary reasons for forgoing PVSA. (Consider restructuring this sentence for clarity.)

   The sentence has been restructured as follows: “When patients in this study were asked why they did not follow through with PVSA, they cited distance, time constraints, and forgetfulness as primary reasons for forgoing PVSA.” (pp. 5-6, 151-153)

8. Line 164: the first PVSA. Patients cite confidence in their vasectomy. (Consider changing "their" to "the" for consistency.).

   We have made broader revisions to improve clarity as recommended. The manuscript now reads “patients feeling confident in the physician or procedure immediately after vasectomy.” (pp. 6, 156-157)

9. In the statistical analysis section, include a justification for the selected covariates (i.e., why those particular variables were chosen for comparison).

   We identified the selected covariates as common and potentially significant confounders that may influence how motivated patients feel

to follow through with the post-vasectomy evaluation process. We now elaborate to state this information in the manuscript, stating: “These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success.” (pp. 8, 201-203)

10. Line 204-205: Consider rephrasing for clarity. E.g., "Of these, 173 patients (45.7%) underwent vasectomy prior to May 2020..."

    Thank you for this suggestion. The text now reads: “Between October 2016 and June 2022, 370 patients were seen by a single provider and underwent vasectomy. Of these, 173 (46.8%) patients underwent vasectomy prior to 05/01/2020 and were given PVSA specimen cup at their in-person postoperative visit.” (pp. 8, 213-215)

11. Line 207-209: It is well-presented that providing the specimen cup at the time of vasectomy increased PVSA completion rates. However, it would be beneficial to give the p-value alongside the OR and CI to offer a sense of the statistical significance of the observed association.

    We elected to provide odds ratios with confidence intervals without p-values since these statistics offer information regarding magnitude, directionality, and spread, offering readers the opportunity to draw conclusions about clinical relevance of our findings. Our confidence intervals are structured such that they exclude the null hypothesis when $p<0.05$. P-values are intended to be interpreted as a binary comparison against alpha (i.e., either statistically significant or not statistically significant). By excluding p-values from our narrative, we seek to avoid the pitfall of readers interpreting the magnitude of our p-values as a proxy for clinical significance.

12. Line 209-210: The comparison between virtual and in-person postoperative visits seems appropriately conducted. Here again, presenting the p-value can offer clarity regarding the statistical significance.

    In response to another reviewer’s comments, this analysis has been removed from our manuscript.

13. Lines 216-226: While the impact of providing the PVSA specimen cup at the time of vasectomy is clear, it would be beneficial to provide more contextual reasons as to why this might be the case outside of simple convenience.

Thank you for this suggestion. We now propose additional reasons for why patient compliance may be impacted by specimen cup timing. We now state: “We speculate that providing patients with a PVSA specimen cup in-hand at time of vasectomy offered the opportunity for surgeons to reinforce the importance of the need to obtain PVSA as part of the process of undergoing vasectomy, rather than a supplementary evaluation after a completed procedure. This may contribute to a stronger perception by patients that PVSA is a routine and important part of the vasectomy process. Additional reasons may include the decreased burden of providing a sample and completing PVSA when a cup is already provided, relative to those who had to return for in-person visit to obtain a specimen cup. Having a PVSA specimen cup at home can also serve as a reminder to provide the specimen sample.” (pp. 9-10, 241-249)

14. Line 226: Consider further exploring patient psychology, behavior, or other anecdotal feedback that might support this claim.

    Thank you for this comment. Per our response to the previous comment, we now further explore additional factors that might support this claim.

15. Lines 227-236: This section provides valuable insights into the effectiveness of virtual post-operative evaluations. A more direct comparison with other studies, or mentioning any studies that directly counter this finding, would add depth to the discussion.

    We would like to thank the reviewer for their suggestion. We make this statement in the context of traditional, in-person post-operative meetings and negative physician perceptions of virtual follow-up. We clarified the context in the manuscript and have included a reference for this claim. The text now reads: “Currently, there are no explicit standards endorsed by the AUA for post-operative practices; though a visit strictly for physical examination of wound healing is not considered routinely necessary, scheduling an appointment specifically for PVSA is suggested but ultimately left up to surgeon preference (6). However, there is significant heterogeneity of practice, and surgeons who currently practice routine post-operative follow-up may have concerns that omission of follow-up appointment would reduce PVSA compliance.” (pp. 10, 250-255)

16. Lines 243-257: This is a well-detailed section, but consistency in citing studies might make it easier to follow. Consider introducing the context of each study (e.g., its objective or hypothesis) before mentioning the findings.

> We agree with the reviewer that this change would improve the flow and structure of our narrative. The text now reads: "In a retrospective analysis of 387 vasectomy patients, Jacobsen et al. compared PVSA compliance rates with drop-in style appointments 8-16 weeks after vasectomy versus mandated, scheduled PVSA appointments at time of vasectomy and found no significant differences (12). However, a study by Dhar et al., 2007 investigating a similar comparison found that among 228 men, 65% returned for PVSA without an appointment while those with pre-scheduled PVSA appointment returned 84% of the time (13)." (pp. 11, 276-281)

17. Lines 258-276: Consider expounding upon the potential implications this might have for the future of vasectomy follow-ups.

> We have expanded the discussion of potential implications as suggested. The text now reads: "Additionally, home-based self-PVSA raises questions and uncertainty in regards to the accuracy and dependability of the results for both patients and for surgeons in verifying vas occlusion. Not all commonly available home-PVSA tests currently on the market have the sensitivity to reliably measure sperm concentrations <=100,000 non-motile sperm/mL, the cut-off commonly cited by the AUA guidelines' definition for occlusive success (6, 17, 18, 19). Unlike laboratory-based PVSA, many home-based PVSA kits also do not assess for sperm motility, and have not yet been studied to assess for the risk of unanticipated pregnancy (18). Other mail-in, home-based PVSA solutions, such as those offered by Fellow, use laboratory analysis and have the potential for detecting lower concentrations of sperm compared to immunodiagnostic techniques. However, the optimization of the mailing procedure has only been validated with semen specimens for routine semen analysis, where sperm concentration is higher, and has not yet been validated with the low-to-zero concentrations expected following vasectomy (19). The inability to assess for accepted markers of vasectomy success and lack of supporting literature may introduce medicolegal risk and limit the extent of accurate clinical guidance that surgeons can confidently provide. In the future, home-based PVSA has the potential to simplify the post-vasectomy experience with advances in technology that allow detection of lower sperm concentrations, development of robust protocols that patients can reliably adhere to, and correlation of home-based PVSA test results with pregnancy risk. Unfortunately, present-day home-based semen analyses have not yet

proven non-inferiority for evaluation of sterility compared to lab- or office-based PVSA, highlighting the continued importance of optimizing compliance to traditional PVSA approaches." (pp. 12-13, 306-326)

18. Lines 277-285: While the limitations provided are appropriate, consider elaborating on how the retrospective nature of the study might influence findings, any potential biases in patient selection or data recording, and any confounding factors that may not have been accounted for.

    Thank you for this suggestion. We now further explore possible implications of our use of retrospective data that reflects patient practices during a major pandemic, including the fact that this is a retrospective study interjected by the COVID-19 pandemic. This is discussed in greater detail in our amended limitations paragraph, beginning on page 13, line 327.

19. The conclusion rightly identifies that providing the PVSA specimen cup at the time of the vasectomy increases completion rates. It might be worthwhile to briefly mention the potential implications of this for clinical practice, patient outcomes, or future research in this domain.

    We would like to thank the reviewer for this suggestion. We now expand on the implications of our findings and next steps, stating: "Given the increasing popularity and interest in vasectomy as a contraceptive option, it is critical that clinical practice surrounding PVSA is designed to optimize patient outcomes. This study's findings that providing PVSA cup at time of vasectomy is associated with higher rates of completing PVSA suggests that this simple change in clinical practice can improve patient outcomes. In addition to improving patient compliance with PVSA, this change in timing can also offer greater flexibility in post-operative practices and facilitate virtual telehealth follow-up. However, due to limitations inherent to the study design, it is possible that this study's findings were impacted by confounding factors related to the pandemic. In future research, it would be prudent to replicate the comparisons made in this study using either a prospective cohort or with an approach that randomizes patients with different protocols for PVSA cup distribution." (pp. 14-15, 357-367)

20. It is concluded that a telehealth post-operative visit is feasible without impact on PVSA compliance. Given the increasing prominence of telehealth in medical practices, especially in the context of recent global events, briefly mentioning its broader significance would add value.

We agree that incorporating the broader global context would add value to the narrative. The text now reads: "This study's findings that providing PVSA cup at time of vasectomy is associated with higher rates of completing PVSA suggests that this simple change in clinical practice can improve patient outcomes. In addition to improving patient compliance with PVSA, this change in timing can also offer greater flexibility in post-operative practices and facilitate virtual telehealth follow-up." (pp. 14-15, 359-363)

Reviewer B

1. There is no real discussion regarding how the pandemic could have caused the changes that you measured. It could easily be that the pandemic left more time to complete the test, as people were working from home. This should be discussed.

   Thank you for this insightful comment. We agree that the pandemic is a significant confounding factor in this study. It is likely that in addition to measurable confounding factors (e.g., such as working from home) additional unmeasurable factors (e.g., such as differences in sentiment towards family planning, societal trends in insurance coverage) also could have influenced the changes we measured in this study. Societal changes associated with the pandemic, including mandated stay-at-home orders and overall changes in sentiment about visiting public spaces such as the physician's office, likely impacted the study's conclusions. It is difficult to quantify the extent that these factors impacted the associations examined in this study. We now explore this limitation, among others, in greater depth in our Discussion, beginning on page 13, line 327.

2. Lines 134-158 perhaps belong in the discussion

   Although the topics of sterility confirmation and broader trends in PVSA compliance are relevant for the discussion, we believe they are also essential for framing the importance of PVSA following vasectomy and the current state of PVSA compliance. This text sets the stage for discussing why it is of increasing importance to optimize conditions to ensure PVSA compliance and confirmation of vasectomy success. Therefore, we elected to keep this text in the Introduction.

3. Is it the cup, or the fact that they can complete it at a local lab? Discussion of how far people travelled to your center might help elucidate this, and it certainly should be discussed.

> We agree that travel distance is an important factor to consider for completion rates. In our study cohort, all patients (regardless of whether they received a vasectomy cup at time of in-person post-operative visit or time of vasectomy) had the same option to submit their sample at a local lab or at a lab at the same institution as their vasectomy. The only difference in protocol was the time and setting of cup provision. As both groups had similar opportunities for PVSA completion following cup receipt, we believe this was unlikely to contribute to the observed differences in PVSA compliance rates. The text has been modified to reflect this sentiment: "Throughout the study duration, all patients had the option to submit their semen analysis sample at a local laboratory or at a laboratory at the same institution as their vasectomy, such that patients did not need to return to the office for PVSA unless desired. All patients were instructed to submit specimen samples at three months and a minimum of 20 ejaculations following vasectomy, with the specimen having to be collected within one hour of drop off at a laboratory of the patient's choosing." (pp. 7, 182-188)

4. I'm surprised to hear that before the pandemic patients were required to follow up in person after vasectomy. I wonder if the authors can speak to why that was the case.

> This protocol represented the standard clinic workflow for this surgeon due to personal and patient preferences. Although this may not be the standard at all practices, it provided a natural experiment during the pandemic to assess the impact of PVSA cup distribution setting on PVSA completion rates. We have modified our manuscript to more explicitly state that the practice of providing in person follow-up was in this context: "Prior to 05/01/2020, this surgeon's standard practice was to provide patients with a post-vasectomy semen analysis cup at the in-person post-operative visit for physical examination of wound healing and to address patient concerns, scheduled two weeks following vasectomy." (pp. 6-7, 174-177)

5. I find it hard to understand that giving the cup at the vasectomy and virtual visits, both of which seem to go hand in hand, had different degrees of effect on the PVSA completion rate. Perhaps more description in the Results about in-person vs virtual in the pre and post- May 2020 times would explain this.

Due to the simultaneous transition from in-person to virtual visits and transition from timing cup at time of follow-up visit to time of vasectomy, it is not possible to separately quantify the two effects. We have therefore removed analyses that examined associations between PVSA completion and setting of post-operative visit.

6. The discussion mentions that home semen kits cannot reliably clear men post-vasectomy, yet Fellow has a kit specifically designed for this.

Although Fellow does offer a home-based testing option where patients produce a specimen at home and ship it to Fellow laboratories in specifically designed packaging, the current available literature analyzing Fellow's testing procedure focuses on verifying specimen viability with their unique shipping protocol for regular semen analysis samples. However, currently available research does not comment on specimens with low-to-zero sperm concentrations expected post-vasectomy, and does not elaborate on whether it is capable of reliably detecting at-or-below the AUA-recommended threshold of <=100,000 non-motile sperm/mL. We attempted to reach out to Fellow inquiring about newer studies; they were unable to provide additional references. We have included discussion of these shortcomings in the manuscript: "Other mail-in, home-based PVSA solutions, such as those offered by Fellow, use laboratory analysis and have the potential for detecting lower concentrations of sperm compared to immunodiagnostic techniques. However, the optimization of the mailing procedure has only been validated with semen specimens for routine semen analysis, where sperm concentration is higher, and has not yet been validated with the low-to-zero concentrations expected following vasectomy (19)." (pp. 13, 313-318)

(19) Samplanski MK, Falk O, Honig S, et al. Development and validation of a novel mail-in semen analysis system and the correlation between one hour and delayed semen analysis testing. Fertil Steril. 2020 Jan;115(4):922-929. doi:10.1016/j.fertnstert.2020.10.047

Reviewer C

1. I see your cohort was divided by period into before vs after May 2020- is this analysis based on pre vs post COVID analysis? Can you be provide more clarity as what is this time caused and influenced PVSA? and/or post op visits?

The decision to divide our cohort into before vs after May 2020 was determined by the change in practice at our institution of promoting virtual visits as a result of the pandemic. It was at this inflection point that we began providing PVSA specimen cup at time of vasectomy rather than time of follow-up since the post-operative follow-up appointment transitioned primarily to a virtual setting. This procedural change was compelled by the COVID pandemic and made for a natural study cohort. However, the pandemic undoubtedly confounds the results of our study due to significant changes in socioeconomic conditions (e.g. time off work, stay at home, unemployment, changes in attitudes regarding family planning, etc.) and patient perceptions (social distancing, negative attitudes toward visiting medical facilities, aversion to public spaces). In our revised manuscript, we now discuss bias that may have been introduced by the disparate conditions before and after May 2020."Our retrospective analysis beginning prior to, and extending through the COVID-19 pandemic introduces biases relating to patient selection inherent to the study design. Given the broad sociopolitical changes that occurred during the pandemic, it is reasonable to assume that patients seeking vasectomy prior to the pandemic and during the pandemic may have had qualitative differences. These differences may have included factors related to mandated lock-downs, wide-ranging shifts to a work-from-home lifestyle, increased free time, social distancing orders, patient sentiments about visiting medical environments during a pandemic, or COVID-mediated social stressors (unemployment, family emergencies, etc.). Although it is difficult to account for the multifaceted impact these factors may have had on motivating patients to seek out vasectomy and to complete prescribed post-vasectomy testing, we compared our cohorts across routinely collected sociodemographic factors and did not find statistically significant differences between groups, suggesting that they were overall similar." (pp. 14, 338-349)

2. I see there are two questions posed here which makes this paper hard to follow? (FIRST) PVSA cup at time of vasectomy on compliance and completion rates overall? (SECOND) the impact of PVSA completion on the subsequent visits?

   We would like to thank the reviewer for this comment. We agree that the two questions made it difficult to follow the narrative. Additionally, the two associations confounded each other. We have revised the manuscript to focus on the question of PVSA compliance in relation to specimen cup timing at in-person post-operative visit versus at time of vasectomy.

3. I would recommend restructuring this paper's analysis to address if cup at time of vasectomy influenced compliance of completion? and subsequently what is the impact on the post op visits (tele vs in person) compared with no cup at vasectomy?

    We have restructured analyses to examine whether timing of cup provision influenced compliance to PVSA. Although it would be interesting to stratify by setting of post-op visit (i.e., virtual vs in-person) to determine whether there was a difference in the association with PVSA completion rates, rates of in-person post-operative visits were low during the pandemic, limiting statistical power. Ideally, this type of analysis would require data where patients are randomly assigned to in-person vs. virtual post-operative visit.

4. In the discussion there is more information on home SA tests and its mixed result given quality and accuracy of these tests. Please rewrite this section to highlight the growing evidence of such home tests and what are available data here? please organize in view of the overall messaging of this paper around the PVSA cup at time of vasecotmy.

    We agree that home-based PVSA is an important consideration for the future of PVSA testing. However, the available literature suggests that home-based PVSA tests either rely on immunodiagnostic techniques unable to reliably assess for azoospermia and rare non-motile sperm (RNMS), or introduce shipping protocols developed for routine semen analysis that have not been validated with the low-to-zero sperm concentrations expected post-vasectomy. While home-based PVSA holds high potential in the future of PVSA, there is currently insufficient evidence that they meet clinical reliability to be used for PVSA compared to traditional, lab- or office-based PVSA. We have added this discussion to the manuscript as follows: "The inability to assess for accepted markers of vasectomy success and lack of supporting literature may introduce medicolegal risk and limit the extent of accurate clinical guidance that surgeons can confidently provide. In the future, home-based PVSA has the potential to simplify the post-vasectomy experience with advances in technology that allow detection of lower sperm concentrations, development of robust protocols that patients can reliably adhere to, and correlation of home-based PVSA test results with pregnancy risk. Unfortunately, present-day home-based semen analyses have not yet proven non-inferiority for evaluation of sterility compared to lab- or office-based PVSA, highlighting the continued importance of optimizing compliance to traditional PVSA approaches." (pp 13, 318-326)

5. please consider citing this current paper on the rise of vasectomy rates in US
    a. https://pubmed.ncbi.nlm.nih.gov/36082550/
    b. https://pubmed.ncbi.nlm.nih.gov/37353084/

    We would like to thank the reviewer for these citations. We have incorporated them into our manuscript. These references provide valuable context for the increasing popularity of vasectomy as a contraceptive option and further underlines the importance of optimizing PVSA compliance in order to ensure contraceptive success. We have incorporated these references into the text as such: "Vasectomy is one of the most common, safe, and cost-effective methods of contraception in men, and continues to gain interest **(**1, 2, 3)**."** (pp. 4, 107-108)

Reviewer D

1. Line 53: This is not a trial (an experimental study) but an observational study. Replace trial by study. Or omit the statement.

    We have made the requested change: "The subjects in this study have not concomitantly been involved in other trials" (pp. 15, 377)

2. Please see comments in the manuscript explaining why I suggest to delete some sentences.

    We appreciate the reviewer's prescriptive review of our manuscript. We have made many of the suggested text modifications/deletions. This has helped improve the flow of our manuscript and improved the quality of our narrative.

3. Line 81-82: this cannot be properly evaluated in this study as all patients prior to May 2020 had both the cup given at the time of the in-person visit and probably almost all with the cup given at the time of vasectomy had a virtual visit.These are too intercorrelated to be analysed separately. I suggest that all concerning virtual vs. in person be deleted from the abstract.

    We would like to thank the reviewer for this comment. Given the high degree of intercorrelation between visit setting and timing of cup, it is not appropriate to delineate the analyses as two separate effects. We have revised the manuscript to focus on the association between time of PVSA specimen cup provision and PVSA compliance.

4. Line 85: retrospective cohort study with historical control using medical records of all patients…

   We have made the suggested change in phrasing: “We performed a retrospective cohort study with historical control using medical records of all patients…” (pp. 2, 51-52)

5. Line 88: specify the timing of this appointement after the vasectomy

   We now specify that post-operative appointment was timed for two weeks following vasectomy. We have amended the manuscript to specify this timeline: “Patients who underwent vasectomy prior to 05/01/2020 had PVSA specimen cup given at postoperative appointment two weeks following vasectomy, and those who underwent vasectomy after 05/01/2020 were given PVSA specimen cup at time of vasectomy.” (pp. 2, 53-56)

6. Line 103-104: name the sociodemographic and clinical variables. authors will need to do these analyses...

   We have amended the manuscript to further describe the sociodemographic and clinical variables analyzed: “There were no significant differences among study cohorts across all patient demographics analyzed, including age, BMI, age of primary partner, presence of children, and history of prior genitourinary infection.” (pp. 2, 61-63).

   Additionally, we have added confounder-adjusted estimates to investigate for potential associations with PVSA compliance. We did not find any statistically significant associations. The text has been further amended to reflect this: “Adjusting for all identified confounders except age of primary partner revealed timing of specimen cup provision at time of vasectomy was associated with higher odds of PVSA completion (aOR = 1.64; 95% CI: 1.08, 2.52).” (pp. 2, 69-73)

7. Line 119: contraceptive success rate

   We have revised the text as recommended: “with contraceptive success rates over 99% **(4)**.” (pp. 4, 109-110)

8. Line 120-133: useless information in the specific context of this study or information that is presented somewhere else in the manuscript.

   We believe this information helps set the stage by outlining the increasing popularity of vasectomy as a contraceptive option, further

emphasizing the importance of increasing PVSA compliance to ensure vasectomy success.

9. Line 128: not a screening but a Dx test

   As part of broader revisions to this section of the manuscript, we have added clarification that PVSA is a diagnostic test: "...vasectomy is also the only contraceptive method that requires post-procedural diagnostic confirmation of sterility known as post-vasectomy semen analysis (PVSA), creating potential issues in patient non-compliance." (pp. 4, 119-121)

10. Line 134: contraceptive failure rates

    We have revised as recommended: "Although overall contraceptive failure rates of vasectomy are less than 1%..." (pp. 5, 129)

11. Line 145: considered sufficiently safe

    We have revised the text as recommended: "...vasectomy is not considered sufficiently safe or reliable as a contraceptive method (6)**."** (pp. 5, 141-142)

12. Line 147: should cite the AUA review data before the individual studies: In the largest cohorts that appear typical of North American vasectomy practice, only about two thirds of men (between 55% and 71%) return for at least one PVSA.28,30,38,243,260,288

    We would like to thank the reviewer for this suggestion and have revised the text to cite the broader AUA review prior to discussing individual studies. We now state: "Despite the known risks of presuming vasectomy is successful without objective evidence of sterility, PVSA compliance rates are generally poor (7, 8, 9). Per the 2015 AUA review of cohorts undergoing vasectomy in Canada, Mexico, and the United States, only approximately 55-71% of patients complete at least one PVSA (6). As far as individual studies have shown, a retrospective review of vasectomies…" (pp. 5, 143-147)

13. Line 159: most vasectomists do not do routine post-operative visit... The European Association of Urology do not recommend post-op visit in its guideline.

    We recognize that routine post-operative visit is not explicitly recommended by urological societies; however, in-person post-operative visit is practiced by many surgeons. Per AUA guidelines,

postoperative visit "specifically for physical examination of the scrotum is not routinely necessary," but a suggestion is made for surgeons to "consider giving men a specific appointment for the first PVSA to improve compliance with follow-up," ultimately leaving this decision up to the surgeon (6). For the specific practice that provided the data for our study, the surgeon recommended routine post-operative visit to accommodate clinician and patient preferences. Our findings are most relevant for surgeons that continue to offer in-person post-operative visit. We have added discussion regarding this to the manuscript: "Currently, there are no explicit standards endorsed by the AUA for post-operative practices; though a visit strictly for physical examination of wound healing is not considered routinely necessary, scheduling an appointment specifically for PVSA is suggested but ultimately left up to surgeon preference (6). However, there is significant heterogeneity of practice, and surgeons who currently practice routine post-operative follow-up may have concerns that omission of follow-up appointment would reduce PVSA compliance." (pp. 10, 250-255)

14. Line 160: see prior comment.

    Thank you for this helpful comment. Per our response to the previous comment, we have expanded discussion regarding the practice of post-operative appointments.

15. Line 160: as most vasectomists do not do routine post-vasectomy visit, the PVSA order is given at the time of vasectomy

    Although many vasectomists provide PVSA order at time of vasectomy, this practice is not standardized across urologists. Due to the lack of guideline-based recommendation for timing of PVSA specimen cup provision, there is heterogeneity in practices. We now explicitly state this context in our manuscript as part of the rationale for this study: "Currently, there are no explicit standards endorsed by the AUA for post-operative practices; though a visit strictly for physical examination of wound healing is not considered routinely necessary, scheduling an appointment specifically for PVSA is suggested but ultimately left up to surgeon preference (6). However, there is significant heterogeneity of practice, and surgeons who currently practice routine post-operative follow-up may have concerns that omission of follow-up appointment would reduce PVSA compliance." (pp. 10, 250-255)

16. Line 162: this is the most common practice…

    Per our response to Comment 13 from this reviewer, we have modified our discussion to address this comment.

17. Line 163: this is already the most common practice: no routine post-vasectomy consultation. when and why a routine post-op visit is needed?

    See response to Reviewer D, Comment #13.

18. Line 166: it does not modify the efficacy of vasectomy. please rephrase:..to confirm the success of vas occlusion.

    We have made the suggested text change: "...rather than part of standard protocol to ensure contraceptive success and confirm vas occlusion…" (pp. 6, 167-168)

19. Line 169: As said earlier, this cannot be properly evaluated in this study as all patients prior to May 2020 had both the cup given at the time of the in-person visit and, probably, almost all with the cup given at the time of vasectomy had a virtual visit.These two variables are too much intercorrelated to be analysed separately. In addition why virtual visit would increase compliance compared to in-person visit?

    We agree. The analyses and manuscript have been extensively modified per our response to comment #3 from this reviewer.

20. Line 176: At what time after vasectomy? one week? one month? Three months? and what is the purpose of this routine visit ? None of the guidelines (AUA- US, EUA- Europe, FRSH -UK, CUA- Canada , AFU- France) recommend routine post-op consultation.

    The post-operative visit was routinely conducted 2 weeks after vasectomy due to the surgeon's personal preference as well as patient preference. We are aware that there is significant heterogeneity in practice, and that the AUA largely leaves the decision for routine post-operative appointments to the surgeon. We have revised the referenced text to specify the post-operative timeline: "Prior to 05/01/2020, this surgeon's standard practice was to provide patients with a post-vasectomy semen analysis cup at the in-person post-operative visit for physical examination of wound healing and to address patient concerns, scheduled two weeks following vasectomy." (pp. 6-7, 174-177)

21. Line 178-179: this is the routine of all vasectomists i know

    Although many vasectomists may not routinely conduct a post-operative visit for PVSA cup distribution, due to the lack of guidelines regarding post-vasectomy PVSA protocols, there is heterogeneity in practice. This study provides evidence that post-operative visit for PVSA cup

distribution may not be beneficial for PVSA completion.

22. Line 180: on what ground? personal or imposed choice?

> The decision to engage in either a virtual or in-person post-operative appointment for patients seen after May 2020 was largely driven by patient preference. However, patients with any concerning symptoms, particularly those suggestive of post-operative complication, were recommended to be seen at an in-person visit. We added clarification to the text as follows: "Prior to 05/01/2020, this surgeon's standard practice was to provide patients with a post-vasectomy semen analysis cup at the in-person post-operative visit for physical examination of wound healing and to address patient concerns, scheduled two weeks following vasectomy. Due to the emergence of COVID-19, to reduce the number of in-person visits, patients who underwent vasectomy after 05/01/2020 were provided with a post-vasectomy semen analysis cup at the time of their vasectomy such that they could submit their samples at a later date. They were also given the choice of either a virtual or in-person post-operative appointment two weeks following vasectomy unless the patient had concerning symptoms, for which the surgeon would require in-person follow-up." (pp. 6-7, 174-182)

23. Line 182: Are there any PVSA done in the office or all are done in outside lab? same in both study groups?

> All patients had the same options for laboratory analysis of the specimen sample. Patients had the option to drop off samples at the hospital laboratory at the same medical campus as the surgeon's clinic office or to deliver the sample to a local laboratory. We have amended the manuscript to better describe this: "Throughout the study duration, all patients had the option to submit their semen analysis sample at a local laboratory or at a laboratory at the same institution as their vasectomy, such that patients did not need to return to the office for PVSA unless desired." (pp. 7, 182-185)

24. Line 183: main independant variable

> We agree and have made broad revisions to the manuscript to focus analyses only on the relationship between timing of PVSA cup provision and PVSA compliance.

25. Line 184: compliance to PVSA

> We made the suggested text change: "...and compliance with post-vasectomy semen analysis were recorded." (pp. 7, 189-190)

26. Line 184: main dependant variable: completion of PVSA: yes or no

The manuscript has been broadly revised such that completion of PVSA is emphasized as our main dependent variable.

27. Line 185: this is not an outcome if it refers to non completion of PVSA.

In the context of our study, completion of per-protocol PVSA is our patient outcome of interest. We have modified phrasing as needed throughout the manuscript to refer to completion as the outcome, rather than non-completion.

28. Line 186: it seems it was not recorded for each patient. In the results section there is 31 patients (370-339=31) without post-operative setting data. Loss to follow-up?

These 31 patients were not lost to follow-up in the sense that it was known whether they did or did not complete PVSA. Though these patients did not attend their per-protocol 2 week post-vasectomy follow-up visit, we were still able to track their compliance with PVSA. Given that we no longer analyze post-operative setting as a predictor for PVSA completion, we no longer include these figures in our manuscript. Instead, since there was heterogeneity in the setting for post-operative visit, we now detail the breakdown of post-operative visit setting for patients seen after 05/01/2020 in our manuscript. “154/197 were seen virtually, 23/197 were seen in person, and 20 did not present to follow-up visit. We now state: “Between October 2016 and June 2022, 370 patients were seen by a single provider and underwent vasectomy. Of these, 173 (46.8%) patients underwent vasectomy prior to 05/01/2020 and were given PVSA specimen cup at their in-person postoperative visit. 197 (53.2%) patients underwent vasectomy after 05/01/2020 and were given PVSA specimen cup at the time of vasectomy. For the cohort that was given the option to select setting of post-operative visit (i.e., those who underwent vasectomy after 05/01/2020), 154 (78.2%) patients were seen virtually and 23 (11.7%) were seen in person.” (pp. 8, 213-219)

29. Line 186: number? Institution?

IRB approval for this retrospective review was granted by NYU Grossman School of Medicine. We have amended the manuscript to reflect the granting party: “Institutional review board (IRB) approval was granted by NYU Grossman School of Medicine for this retrospective study.” (pp. 7, 190-191)

30. Line 190-191: pvsa

    We have gone through the entirety of the manuscript to update as recommended.

31. Line 190: two models with unadjusted results are presented. Only one model of the association of exposure to cup and compliance to PVSA should be presented. No model on type of visit should be performed. The model should be adjusted for secondary independant variables presented in table 1). There will probably be no change in the OR as groups are quite comparable for all variables, but if logistic regresion is used then an adjusted model if preferable. The other option, if the authors do not want to present an adjusted OR, is to present a risk diffrence with a 95% confidence interval. Much easier to understand than an OR.

    We would like to thank the reviewer for this suggestion. We no longer model PVSA compliance as a function of visit setting. Additionally, we now include adjusted models which control for potential confounders. Due to approximately 10% of patients in our study not having a primary partner, the adjusted model relied on a sample that was substantially smaller than our full cohort. We additionally fitted an adjusted model that accounted for all confounders except age of primary partner. Presenting odds ratios for retrospective analyses is common statistical practice within the urologic literature and reflects the results of the logistic regressions used in our analyses. Although a risk difference could be derived, we are concerned that it could be misleading or non-generalizable due to biased sample selection relating to the pandemic.

32. Line 193: this is not the reason why the study groups are compared. Even in a RCT the groups may differ by chance. The characteristics of the groups need to be compared to assure that there is no potential confounding bias.

    We compare the patient characteristics of both analysis groups to evaluate for confounding factors that may influence the final analysis, and found no statistically significant differences in patient age, partner age, number of children, history of GU infection, and patient BMI. To clarify this, we have amended the manuscript as follows: “To evaluate for differences in baseline patient characteristics that could be responsible for differences in PVSA completion between those who received PVSA cup at time of post-operative visit versus at time of vasectomy, Wilcoxon rank-sum tests and chi-squared tests were used to assess for associations between potential confounders (i.e., patient age, age of patient’s primary partner, patient BMI, presence of existing

children, and history of genitourinary [GU] infection) and timing of PVSA specimen cup receipt. Additionally, Wilcoxon rank-sum tests and chi-squared tests were used to assess associations between these potential confounders and compliance with PVSA. These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success." (pp. 7, 194-203)

33. Line 194: the clinical significance of the observed difference between groups should be the main criteria to judge if the groups are comparable or not...

    We identified potential confounding factors that may impact a patient's likelihood to complete PVSA, including patient age, age of primary partner, patient BMI, presence of children, and history of GU infection. Wilcoxon rank-sum and chi-square tests were used to determine potential differences across ordinal/continuous and binary patient characteristics, respectively. There were no statistically significant differences in these characteristics between the two study groups; because the observed differences in patient characteristics are likely due to random chance, we did not feel it would be appropriate to discuss clinical significance of differences in this context.

34. Line 197: marital status? number of children?

    In the patient population that is seen in our practice, many patients are not necessarily married, although they may have a long-term partner. Therefore, we elected not to include marital status as a covariate. Instead, we include age of primary partner due to our belief that social, cultural, and biological factors relating to partner age may influence motivation for a patient to complete PVSA. Additionally, our analyses adjust for presence of children. We added clarification to the text on how potential confounders were considered in our study: "To evaluate for differences in baseline patient characteristics that could be responsible for differences in PVSA completion between those who received PVSA cup at time of post-operative visit versus at time of vasectomy, Wilcoxon rank-sum tests and chi-squared tests were used to assess for associations between potential confounders (i.e., patient age, age of patient's primary partner, patient BMI, presence of existing children, and history of genitourinary [GU] infection) and timing of PVSA specimen cup receipt. Additionally, Wilcoxon rank-sum tests and chi-squared tests were used to assess associations between these potential confounders and compliance with PVSA. These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success." (pp. 7, 194-203).

35. Line 199: analyses are not "conducted" with an alpha value... the alpha value is the threshold for interpreting the statistical significance of results. Need rephrasing.

    We have revised this statement for clarity as follows: "...the threshold of statistical significance was set at an alpha of 0.05." (pp. 8, 208-209)

36. Line 201: there is a need for a stuy flow chart. we need to know among the 173 not exposed, how many had a in-person post-op visit and how many did not attend this visit. In the 197 exposed, how many had virtual, in-person, and no visit. And for each sub group the number (and %) of patients compliant to PVSA.

    We would like to thank the reviewer for this suggestion. We have amended the description of our study cohort to clarify the post-operative visit setting distribution for patients seen after 05/01/2020 who were given the option to choose the post-operative setting. However, we no longer analyze the influence of post-operative visit setting in this manuscript and thus believe this flow chart would not add to our primary analyses in a relevant manner.

37. Line 202: Authors should not begin a sentence with a numeral

    We have corrected this as follows: "Between October 2016 and June 2022, 370 patients were seen by a single provider and underwent vasectomy." (pp. 8, 213-214)

38. Line 202: already said

    The inclusion of this brief statement helps to outline the broader setting in which our results were observed.

39. Line 203: all this can be presented in a flow chart. see earlier comment.

    We have significantly revised the manuscript to focus on analysis of PVSA cup timing rather than post-operative visit setting. For greater detail, please refer to our response to comment #36 from the same reviewer.

40. Line 211: Comparision of the characteristics of the study groups should be presented ealier in the result section.

    We would like to thank the reviewer for this suggestion. We have introduced revisions to discuss covariate analyses earlier in the Results section. The manuscript now reads as such: "In terms of patient

characteristics, no detectable differences were found between those who had PVSA cup provided at time of vasectomy and PVSA cup provided at post-operative visit for all patient characteristics investigated (Table 1). Further analysis of these patient characteristics individually revealed that there were no statistically significant association with PVSA completion (Table 2).” (pp. 8-9, 219-223)

41. Line 216: to be sure none of these factors generate a confounding bias, compliance to PVSA for each variable should be presented . So a table 2 presenting the compliance according to the main independant variable (the cup exposure) and for each characteristic including statistical analysis results should be available.

    We would like to thank the reviewer for this suggestion. We now compare all confounding variables against PVSA compliance. Notably, we did not identify any statistically significant differences. We include information about these measures, stratified by PVSA compliance, as well as statistical testing for associations between these measures and PVSA compliance, in Table 2.

42. Line 216: this is not a large cohort…

    We have removed references to “large cohort” as follows: “Our retrospective review of 370 men…” (pp. 9, 237)

43. Line 217: there is no reasons why replacing an in-person by a virtual visit would change compliance to PVSA and this study cannot evaluate this specific factor.

    We have revised the manuscript to focus on PVSA specimen cup timing.

44. Line 217: this is a low volume practice: 370 /7 years= 53 vasectomies/year

    We have removed references for “high volume” throughout the manuscript as such: “...undergoing vasectomy with a single surgeon suggests…” (pp. 9, 237-238)

45. Line 228: where are the references of this "growing body of evidence" ?

    Many ideas have been suggested to PVSA compliance, but results have been mixed. We have amended the manuscript with an additional reference in addition to citing other relevant references present on our previous submission, and have revised this statement as follows: “Our

results join a body of work where numerous approaches have been studied in attempting to increase PVSA completion rates, though none have been proven to show a consistent advantage (6, 8, 10, 12).” (pp. 11, 273-275)

(8) Welliver C, Zipkin J, Lin B, et al. Factors affecting post-vasectomy semen analysis compliance in home- and lab-based testing. Can Urol Assoc J. 2023 Jul;17(7):E189-E193. doi: 10.5489/cuaj.8118. PMID: 37068146; PMCID: PMC10382220.

46. Line 229: effective to what?

This text has been removed from the manuscript since we no longer analyze differences in PVSA compliance between in-person and virtual post-operative visit.

47. Line 231-233: yes, but what is the evidence that any routine post-vasectomy consultation is needed?

The decision to have patients return for post-operative evaluation was due to surgeon and patient preference at this practice. Though we, like many other providers, may recommend patients return for routine post-operative follow-up, we acknowledge that this is a practice neither explicitly recommended nor condemned by the AUA or EUA. We do not seek to make the point that post-operative follow-up is necessary; rather, we are describing the situation that existed at this practice in the context of our cohort study. We clarify this position as follows: “Currently, there are no explicit standards endorsed by the AUA for post-operative practices; though a visit strictly for physical examination of wound healing is not considered routinely necessary, scheduling an appointment specifically for PVSA is suggested but ultimately left up to surgeon preference (6). However, there is significant heterogeneity of practice, and surgeons who currently practice routine post-operative follow-up may have concerns that omission of follow-up appointment would reduce PVSA compliance.” (pp. 10, 250-255)

48. Line 239: same refrence as7

We have corrected the text as follows: “Qualitatively, PVSA completion in our patient population is consistent with rates seen in the currently available literature. Overall, 56.5% of patients who had a vasectomy completed PVSA, falling within a wide range of observed PVSA compliance rates between 39% and up to 71% (6, 7, 8, 9).” (pp. 11, 267-270)

49. Line 239: this comes from AUA guideline review on the topic. please cite the adequate reference.

    Thank you for this suggestion. Per previous comments, we have corrected the manuscript with the appropriate reference.

50. Line 240: repetition from the introduction... at least be consistent by citing all the related references from the introduction

    We have amended the text to include related references as follows: “All previously discussed explanations for low PVSA compliance likely apply in our cohort as well, including high patient confidence in vasectomy success, inconvenience of semen analysis, and need for repeat postoperative visit (11).” (pp. 11, 270-272)

51. Line 249: this is a comparative trial but no mention that patients were randomized

    Thank you for this comment. We have revised the text to more accurately describe the study: “However, a study by Dhar et al., 2007 investigating a similar comparison found that among 228 men…” (pp. 11, 279-280)

52. Line 252: cite the aua guideline

    We have amended the citation as follows: “practice of scheduling PVSA appointments in advance up to the discretion of the surgeon (6).” (pp. 11, 282-283)

53. Line 254: same as ref 5

    We have corrected the text as follows: “Given that AUA guidelines promoting PVSA completion as a critical part of guideline-adherent vasectomy post-operative care, in the absence of strong evidence-based strategies for improving PVSA completion rates, it is the responsibility of the individual surgeon offering vasectomy to develop protocols for maximizing PVSA completion rates by addressing patient barriers in their patient populations (6).” (pp. 11, 283-287)

54. Line 257: good point

    Thank you.

55. Line 263: this clinically significant difference. a 10% difference is clinically significant! In your study the difference is 12.7% . This is not very different and you consider your results as clinically significant...

> We intended to comment on the lack of statistical significance in this result, and acknowledge the clinical significance of this difference. We revised the text to clarify as such: though clinically significant if this difference is real and not due to random chance, it did not achieve statistical significance (p=0.095) (14).” (pp. 12, 293-294)

56. Line 263: please rephrase: Punjani et al reported that among 364 patients in whom 30%...

> We have revised the text as recommended: “Punjani et al., 2021 reported that among 364 patients, in whom 30% voluntarily opted…” (pp. 12, 294-295)

57. Line 267: this is not related to compliance. The only comment that can be made is that results of study are mixed. I suggest you delete these sentences. Postal strategy however should be discussed. see Atkinson et al. Comparison of postal and non-postal post-vasectomy semen sample submission strategies on compliance and failures: an 11-year analysis of the audit database of the Association of Surgeons in Primary Care of the UK. BMJ Sex Reprod Health. 2022 Jan;48(1):54-59. doi: 10.1136/bmjsrh-2021-201064. Epub 2021 Jul 28. PMID: 34321257.

> We believe this discussion of various alternate strategies proposed to increase PVSA compliance is relevant to our manuscript’s focus on methods to improve PVSA compliance. We are intrigued by the findings of Atkinson et al, 2022, particularly in that they found success in the UK whereas home-based PVSA trials in the USA have not always had similar findings. We have augmented the manuscript with this discussion and reference: “Interestingly, Atkinson et al., 2022 found that among 58,900 vasectomy patients, PVSA compliance was greater when patients were advised to submit PVSA samples from home via mail compared to those advised to undergo laboratory-based testing (79.5% vs 59.1%, respectively); notably, this study was based in the United Kingdom while other studies quoted were based in the United States (16). This raises interesting questions about the influence of culture in PVSA compliance. For surgeons in the United States, however, the currently available literature calls into question whether the convenience

and accessibility benefits of at-home PVSA translate into clinically meaningful improvements in PVSA compliance." (pp. 12, 298-305)

58. Line 269: occlusive success

We have revised the text as recommended: "...the cut-off commonly cited by the AUA guidelines' definition for occlusive success (6, 17, 18, 19). " (pp. 12, 309-310)

59. Line 272: ???

Physicians serve an important role in helping interpret and explain clinical implications of PVSA results, particularly those that are abnormal. Certain immunodiagnostic home-based PVSA approaches rely on patients to interpret the test outcome. Other home-based PVSA approaches may deliver a laboratory result directly to the patient before the surgeon. Improper interpretation in either case opens the door to inappropriate clinical follow-up. We clarify this statement as follows: "The inability to assess for accepted markers of vasectomy success and lack of supporting literature may introduce medicolegal risk and limit the extent of accurate clinical guidance that surgeons can confidently provide." (pp. 13, 318-320)

60. Line 277: many more. -historical cohort -limitation of data extracted from medical records including missing data -limited sample size -unadjusted results and taking into account potential confounding bias (this shoud be corrected) -uncorrect use of type of consultation in the analysis (this shoudl be corrected) -missing information about some results (thisi should be corrected) -wrong references (this should be corrected)

Thank you for these suggested improvements to our Limitations section. We have substantially expanded our Limitations:"Our retrospective analysis beginning prior to, and extending through the COVID-19 pandemic introduces biases relating to patient selection inherent to the study design. Given the broad sociopolitical changes that occurred during the pandemic, it is reasonable to assume that patients seeking vasectomy prior to the pandemic and during the pandemic may have had qualitative differences. These differences may have included factors related to mandated lock-downs, wide-ranging shifts to a work-from-home lifestyle, increased free time, social distancing orders, patient sentiments about visiting medical environments during a pandemic, or COVID-mediated social stressors (unemployment, family emergencies, etc.). Although it is difficult to account for the multifaceted impact these

factors may have had on motivating patients to seek out vasectomy and to complete prescribed post-vasectomy testing, we compared our cohorts across routinely collected sociodemographic factors and did not find statistically significant differences between groups, suggesting that they were overall similar." (pp. 14, 338-349)

61. Line 289: but is it needed on a routine basis?

    This is similar to other comments; please refer to Reviewer D, Comment #47.

62. Line 290: again this conclusion cannot be made with the design of the study.

    We agree with the reviewer and have revised the manuscript accordingly. We now focus on impact of specimen cup timing on PVSA compliance.

63. Line 312-314: same ref. delete one.

    This has been corrected.

64. delete . already cited as ref 5

    This has been corrected.

65. what is the compliance associated with each of these variables? other variables to consider: marital status, number of children

    In the patient population that is seen in our practice, many patients are not necessarily married, although they may have a long-term partner. Therefore, we elected not to include marital status as a covariate. Instead, we include age of primary partner due to our belief that social, cultural, and biological factors relating to partner age may influence motivation for a patient to complete PVSA. Additionally, our analyses adjust for presence of children. We elected to focus on presence of children as a binary measure, rather than number of children, since we felt that family planning in the context of plan for vasectomy after having no children vs. any children would be a more substantial confounder in the relationship investigated in our study. We were unable to include both presence of children and number of children as separate variables given their high degree of colinearity. We analyzed each confounder individually to determine their potential impact on compliance and have amended the manuscript with these results in Table 2; none of the variables analyzed revealed statistically significant differences in compliance.

66. Checklist Item 1a: study design not mentioned in title

The recommendation from *Translational Andrology and Urology* is that the study's design should be indicated with a commonly used term "in the title or the abstract." We describe the retrospective nature of the study in the abstract as follows: "We performed a retrospective cohort study with historical control using medical records of all patients seen by a single provider for vasectomy consultation between October 2016 and June 2022." (pp. 2, 51-53)

67. Checklist Item 7: not clear

We have clarified the text to explain our analysis of potential confounders as follows: "To evaluate for differences in baseline patient characteristics that could be responsible for differences in PVSA completion between those who received PVSA cup at time of post-operative visit versus at time of vasectomy, Wilcoxon rank-sum tests and chi-squared tests were used to assess for associations between potential confounders (i.e., patient age, age of patient's primary partner, patient BMI, presence of existing children, and history of genitourinary [GU] infection) and timing of PVSA specimen cup receipt. Additionally, Wilcoxon rank-sum tests and chi-squared tests were used to assess associations between these potential confounders and compliance with PVSA. These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success. " (pp. 7-8, 194-203)

68. Checklist Item 9: not done

To address potential confounding effects, we analyzed a variety of potential confounders including age of primary partner, presence of children, patient age, patient BMI, and history of GU infection. We now provide confounder-adjusted estimates in our Results, as well as individual analysis of confounders and impact on PVSA compliance. Notably, no confounding variable demonstrated statistically significant differences in PVSA compliance. The text has been updated as such: "To evaluate for differences in baseline patient characteristics that could be responsible for differences in PVSA completion between those who received PVSA cup at time of post-operative visit versus at time of vasectomy, Wilcoxon rank-sum tests and chi-squared tests were used to assess for associations between potential confounders (i.e., patient age, age of patient's primary partner, patient BMI, presence of existing

children, and history of genitourinary [GU] infection) and timing of PVSA specimen cup receipt. Additionally, Wilcoxon rank-sum tests and chi-squared tests were used to assess associations between these potential confounders and compliance with PVSA. These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success.
The association between timing of PVSA specimen cup receipt and PVSA completion was investigated using logistic regression. The logistic regression was adjusted for the potential confounders noted above. Given that a substantial number of patients did not have a primary partner, alternative adjusted analyses were conducted which did not control for age of primary partner. 95% confidence intervals were derived for all logistic regressions." (pp. 7-8, 194-208)

69. Checklist Item 11: not clear

We describe the breakdown of the study cohort via text description in both the Methods and Results sections of the paper. Per responses to earlier comments, we have expanded this description.

70. Checklist Item 12a: not done

We describe all statistical methods used in this manuscript in the Methods section, under Statistical Analysis, which include logistic regressions for analysis of our primary findings, and Wilcoxon rank-sum tests and chi-squared tests to determine potential differences across ordinal/continuous and binary patient characteristics, respectively. Additionally, we have now amended the manuscript with confounder-adjusted estimates. The text has been revised to clarify this as follows: "To evaluate for differences in baseline patient characteristics that could be responsible for differences in PVSA completion between those who received PVSA cup at time of post-operative visit versus at time of vasectomy, Wilcoxon rank-sum tests and chi-squared tests were used to assess for associations between potential confounders (i.e., patient age, age of patient's primary partner, patient BMI, presence of existing children, and history of genitourinary [GU] infection) and timing of PVSA specimen cup receipt. Additionally, Wilcoxon rank-sum tests and chi-squared tests were used to assess associations between these potential confounders and compliance with PVSA. These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success.
The association between timing of PVSA specimen cup receipt and

PVSA completion was investigated using logistic regression. The logistic regression was adjusted for the potential confounders noted above. Given that a substantial number of patients did not have a primary partner, alternative adjusted analyses were conducted which did not control for age of primary partner. 95% confidence intervals were derived for all logistic regressions." (pp. 7-8, 194-208).

71. Checklist Item 12b: not done

Please see response to Reviewer D, Comment #70.

72. Checklist Item 12c: missing data in independant variables

Our study does not have any data in our independent or dependent variables. Although some patients did not present at post-vasectomy follow-up visit, the status of their PVSA was known. We now describe our cohort as follows: "Between October 2016 and June 2022, 370 patients were seen by a single provider and underwent vasectomy. Of these, 173 (46.8%) patients underwent vasectomy prior to 05/01/2020 and were given PVSA specimen cup at their in-person postoperative visit. 197 (53.2%) patients underwent vasectomy after 05/01/2020 and were given PVSA specimen cup at the time of vasectomy. For the cohort that was given the option to select setting of post-operative visit (i.e., those who underwent vasectomy after 05/01/2020), 154 (78.2%) patients were seen virtually and 23 (11.7%) were seen in person." (pp. 8, 213-219)

73. Checklist Item 12d: not done

We did not have loss to follow up within our cohort, and revised the manuscript to clarify this in the Results section. Though patients may not have attended post-operative follow-up appointment, we were still able to track PVSA compliance.

74. Checklist Item 14a: partly done

We hypothesized potential confounders that could be analyzed using the data collected in this retrospective cohort study, and describe these exposures and potential confounders most prominently in the Methods and Results sections of the paper. The specific revisions addressing this are as follows: "To evaluate for differences in baseline patient characteristics that could be responsible for differences in PVSA completion between those who received PVSA cup at time of post-operative visit versus at time of vasectomy, Wilcoxon rank-sum tests and

chi-squared tests were used to assess for associations between potential confounders (i.e., patient age, age of patient's primary partner, patient BMI, presence of existing children, and history of genitourinary [GU] infection) and timing of PVSA specimen cup receipt. Additionally, Wilcoxon rank-sum tests and chi-squared tests were used to assess associations between these potential confounders and compliance with PVSA. These potential confounders were selected due to the belief that they may influence interest in completing PVSA, introduce complications to the vasectomy process, or affect confidence in vasectomy success." (pp. 7-8, 194-203)

Additionally, Table 1 highlights patient characteristics stratified by time of PVSA cup receipt. Table 2 then investigates potential associations of patient characteristics and PVSA compliance; notably, no statistically significant associations were elucidated.

75. Checklist Item 16a: not done

We have modified our analyses to adjust for potential confounders. Please refer to our revised Results section, as well as Table 2.

76. Checklist Item 19: not clear, counfounder, sample size, stat vs clin significant

We added to our discussion of the study's limitations, including opportunities for potential bias and imprecision such as a geographically limited sample size of 370 patients at one provider over multiple years. Additionally, the pandemic undoubtedly confounds the results of our study due to significant changes in socioeconomic conditions (e.g. time off work, stay at home, unemployment, changes in attitudes regarding family planning, etc.) and patient perceptions (social distancing, negative attitudes toward visiting medical facilities, aversion to public spaces). These revisions are reflected in the Discussion, beginning with "Our study has several limitations worthy of discussion." (pp. 13, 327). Additionally, we have reviewed and revised all claims of statistical and clinical significance in the manuscript and confirmed that appropriate verbiage is used.

77. Checklist Item 20: partial

We introduce revisions to the Conclusion that provide a cautious, balanced interpretation of our results as follows: "Providing a PVSA specimen cup at the time of vasectomy rather than at postoperative appointment increases PVSA completion rates. Given the increasing popularity and interest in vasectomy as a contraceptive option, it is

critical that clinical practice surrounding PVSA is designed to optimize patient outcomes. This study's findings that providing PVSA cup at time of vasectomy is associated with higher rates of completing PVSA suggests that this simple change in clinical practice can improve patient outcomes. In addition to improving patient compliance with PVSA, this change in timing can also offer greater flexibility in post-operative practices and facilitate virtual telehealth follow-up. However, due to limitations inherent to the study design, it is possible that this study's findings were impacted by confounding factors related to the pandemic. In future research, it would be prudent to replicate the comparisons made in this study using either a prospective cohort or with an approach that randomizes patients with different protocols for PVSA cup distribution." (pp. 14-15, 356-367)