

Reviewer A:

*Comment 1: Congratulations for this work.*

*I agree with the findings of this review that male stress test and MSIGS are important in the diagnostic armamentarium to approach a patient with stress incontinence and the results show that MSIGS correlate well with 24-pad test. However, even though MSIGS is very clear and easy to use, to my opinion the cough stress test need further standardization (standard bladder volume, standard position, standard number of coughs, use of bulbar compression test).*

Reply 1: While the authors agree that complete standardization would be ideal, it's not always practical. Obtaining a standard bladder volume would be invasive (either by in-office cystoscopy or back-filling via catheterization) or time/resource intensive (serial bladder scans until patient reaches specified volume). However, as the average functional bladder volume varies greatly from patient to patient, the SCT can individualize the severity of stress incontinence based on what volumes the patient comfortably stores throughout the day.

*Comment 2: My main comment is why you have chosen a narrative review instead of a systematic review? A systematic review on this topic would be more thorough and valuable.*

Reply 2: The authors agree that a systematic review on the topic of male stress incontinence would be more thorough and valuable. However, the objectives for this manuscript were to identify and summarize what has been previously published on MSIGS, and to track and report on changes that have occurred since its use was first published in 2016. As most of the data presented here is retrospective in nature and from a single institution, the level of evidence, in our opinion, did not fit the standards of a systematic review. For these reasons a narrative review was chosen in favor of systematic review. Hopefully MSIGS gains popularity and multi-institutional and/or prospective studies can be evaluated as systematic review.

Per TAU description of narrative review found on their website: A narrative review is less methodologically demanding than a systematic review, as it does not require a search of all literature in a field, nor does it necessarily require a rigorous appraisal on the included literature.

*Comment 3: A minor comment, is to replace citation No 25 with the updated new EAU guideline section on male incontinence which is under the male non-neurogenic LUTS incl BPO.*

Reply 3: Updated the citation No. 25 to include more recent literature.

**“Gratzke, C., et al., EAU Guidelines on the Assessment of Non-neurogenic Male Lower Urinary Tract Symptoms including Benign Prostatic Obstruction. European Urology, 2015. 67(6): p. 1099-1109.” Lines 277-279**

Reviewer B:

*The authors present a narrative review of the role of MSIGS in the preoperative assessment of male SUI. The review is well-written but some important improvements are mandatory*

*Comment 1: Introduction: Please explain the rationale of this review. Why is this review needed?*

Reply 1: This is now addressed in the introduction. We tried to highlight the idea that objective measures of male stress incontinence are cumbersome and that MSIGS provides a quick and easy tool that is accessible to the community urologist when evaluating male SUI.

**“Objectively quantifying the degree of a man’s incontinence is challenging and historical measures place a significant burden on the patient.**

**In 2016, Morey et al developed a novel standardized incontinence grading scale with the commonly used standing cough test. This simple, non-invasive test could be easily incorporated into any community urology practice, however further research was warranted. There have been multiple publications since that time further evaluating the utility of this grading scale.”**  
Lines 65-71

*Comment 2: Please elaborate more on your methods. Do not present them in the form of a Table. Please write 2-3 paragraphs about your searches, your findings and your selection process*

Reply 2: The table has been removed and a paragraph discussing our search/selection methods was added to the manuscript.

**“A review of the male stress incontinence literature was conducted using PubMed and Google Scholar, reviewing articles that discuss the standing cough test, development of the male stress incontinence grading scale, its correlation with objective measures of male SUI, and its use in guiding the choice of anti-incontinence surgical management. All studies that utilized the male stress incontinence grading scale to evaluate male SUI published after the pilot study in 2016 were included in this study. There were nine articles included, seven of which were from the same institution. The first and second authors independently compiled articles, compared results, and jointly summarized the findings.”** Lines 76-83

*Comment 3: Evaluation of SUI: Please include a comment about the classification of male SUI based on the ICS classification for female SUI. Is it safe to use the three grades applied in women to men? Also please avoid using expressions referring to your experience. Instead, use expressions like "high-volume centers suggest"*

Reply 3: Attempts were made to find literature discussing the three grades for female stress incontinence this reviewer referred to however no such grading system was found. The publication for education module for the ICS - Uniform Stress Test was found and reviewed and mentioned in the future directions section of the manuscript. Within this referenced publication, the results are either determined to be positive or negative, but no grades are assigned to our knowledge... Please provide exact reference if this is mandatory addition for the manuscript under review.

**The International Continence Society (ICS) has standardized the cough stress test in the evaluation of female stress incontinence using the ICS-Uniform Stress Cough Test educational module. This module instructs on the performance, interpretation, and reporting of the CST in a standardized manner[31].”** Lines 200-204

As for the second half of this comment, we are unfortunately forced to using terminology referring to our experience as there are no other high-volume centers to our knowledge who regularly utilize or report on use of MSIGS in clinical evaluation of male stress incontinence. Some changes have been made as listed under response to Reviewer C.

*Comment 4: Please include 1-2 paragraphs about the use of the MSIGS in previous studies. Which studies have used MSIGS as a diagnostic tools?*

Reply 4: All studies reviewed in this manuscript utilized the MSIGS as a diagnostic tool, this is now mentioned as criteria for inclusion in the review manuscript under methods section.

**“All studies that utilized the male stress incontinence grading scale to evaluate male SUI published after the pilot study in 2016 were included in this study.” Lines 79-81**

*Comment 5: Please expand the future directions paragraph. State that the choice of the applied surgical intervention for male SUI is not only anchored on the level of SUI but also on the patient characteristics and expectations, age, comorbidities and performance status.*

Reply 5: The future directions section was expanded as requested with the addition of the following 2 paragraphs.

**“Although MSIGS provides a standardized grading scale for interpreting the standing cough test, there is no standardization to the standing cough test itself. The International Continence Society (ICS) has standardized the cough stress test in the evaluation of female stress incontinence using the ICS-Uniform Stress Cough Test educational module. This module instructs on the performance, interpretation, and reporting of the CST in a standardized manner[31]. The development of a similar educational module for evaluation of male stress incontinence would be useful in the dissemination of this invaluable diagnostic tool.**

**“Further validation of this grading scale is recommended as much of the existing literature is retrospective in nature and from a single institution. Multi-institutional efforts are needed to further validate MSIGS either by correlating with a validated SUI questionnaire, urodynamic findings or by confirming correlation with 24 hour-pad weight.” Lines 199-209**

The second part of this comment was partially addressed in the original submission within the introduction section. This has been expanded slightly and reads as follows, our preference would be to keep this in the introduction section instead of moving to the future directions paragraph.

**“The choice of surgical management for male SUI is influenced by several factors, including the severity of incontinence, age, comorbidities, performance status, and patient expectations/preferences.” Lines 63-65**

Reviewer C:

*Comment: In this narrative review of the Male Stress Incontinence Grading Scale, the authors review the use of this tool for grading the standing cough test in the workup of male stress incontinence. While the topic is interesting and the content informative, the overall manuscript suffers from an incomplete discussion of the context of male stress incontinence diagnosis as well as an inconsistent narrative voice. I believe the work is important and a future version of this manuscript should be accepted for publication, but not without major revisions.*

*Regarding the narrative voice first, the authors, as they acknowledge in the limitations are part of the research group that first described and has most often published on the Male Stress Incontinence Grading Scale. Because of this, at times their article is written in the first-person active, and at other times in the third-person passive. This shifting point of view may cause the reader to question the bias behind each source. It is distracting and detracts from the authors' analysis.*

*One way to clear up both concerns for bias as well as improve the utility of the article would be to expand the scope of the review to include all diagnostic tools used in the workup of male stress urinary incontinence. This could include non-invasive tests, patient-reported outcome measures, and procedures like urodynamics or*

*cystoscopy. By adding these additional sections, the authors may be able to better contextualize their discussion of the Male Stress Incontinence Grading Scale and at the same time decrease potential concerns for bias.*

*To summarize, I would recommend the authors:*

*-Thoroughly edit their review to maintain a third-person passive voice, and*

*-Expand the scope of the article to include all diagnostic tools for the evaluation of male stress urinary incontinence*

Reply: After careful consideration of the reviewer's comments, we respectfully disagree with some of the suggested changes. As the title suggests, the intent of this article is to summarize published work about a novel standardized grading scale for the standing cough test in evaluation of men with stress incontinence. This is not a systematic review of evaluation of stress incontinence and therefore a widened scope would take away from the focus on MSIGS. As such, we fully recognize that most of the publications reviewed are from the same research group which therefore makes bias unavoidable. It is our opinion that using different language when discussing topics that are inherently biased and based on opinion/experience can allow the reader to easily distinguish what is author opinion and what is more thoroughly vetted.

There were instances where we did change from first person active voice where appropriate.

Changed "During our pilot study, we found..." to read as follows.

**"During the pilot study, which included 62 consecutive patients who underwent MSIGS testing at initial clinic evaluation, a strong correlation was found" lines 134-136**

Removed "...which is consistent with our findings based on the MSIGS correlation to 24 hour pad weight" to read as follows.

**"Kumar et al found that slings have significantly lower efficacy for patients with pad weight  $\geq$  400gm which correlates closely to MSIGS score of three [1, 15, 22, 23]" lines 140-141**

Changed "Since its inception, our group has attempted to identify factors associated with anti-incontinence surgery (AIS) failure" to read as follows.

**"Multiple factors associated with anti-incontinence surgery failure have been identified." Line 142**

Changed "Using a nomogram-generated probability of failure rate  $\leq$  30%, we identified the "ideal" sling candidate as having..." to read as follows.

**"Using a nomogram-generated probability of failure rate  $\leq$  30%, the "ideal" sling candidate was identified as having..." Lines 143-144**

Changed "...comparing receiver-operating characteristic curves, our nomogram (AUC = 0.81) built on..." to read as follows.

**"...comparing receiver-operating characteristic curves, the nomogram (AUC = 0.81) built on..." lines 145-146**

Changed "...AUS by incorporating MSIGS into our standard male SUI evaluation" to read as follows.

**“...AUS by incorporating MSIGS into the standard male SUI evaluation” lines 178-179**

Reviewer D:

*Comment: Very nice and thorough. I think this is an important document that sums up the contemporary literature.*

*As you accurately point out, much of male stress incontinence is subjective. I would ask to clarify and unpack the concept of "success" and "satisfaction". This can either be done as a separate paragraph in the limitations section or describing what method each paper you cite used for each.*

Reply: Added this information in the following sections as the articles were mentioned within the manuscript.

**“Patient reported satisfaction rates (defined by responses to Patient Global Impression of Improvement) were 95% for AUS and 96.5% for sling” Lines 160-161**

**“In our experience, the success rates (defined as 1 or fewer PPD) following male sling placement in the favorable group are significantly higher than the unfavorable group...” Lines 172-174**

**“Dorado et al. used the MSIGS nomogram to predict success (defined as no pads or a single PPD with  $\leq 20$ -mL 24-hr pad-test) following Adjustable Transobturator Male Sling...” lines 187-188**

**“Abramowitz et al. failed to find a correlation between MSIGS and success rates (defined by 1 or less PPD at last follow up) for the Virtue male quadratic sling...” lines 192-193**

Reviewer E:

*Comment 1: I congratulate to the nicely written review on your severity grading of male SUI. This is still a controversial topic in the field of functional urology which has not been adequately addressed ever since. Your approach appears feasible particular in daily clinical practice and is of interest; also for further research.*

*Please find enclosed my comments:*

*Methods*

*Please indicate a title for the table. Furthermore, a table should not be the only content after the title. I suggest to add a text to the methods section, despite referring to the table. You may reconsider to add only text.*

Reply 1: I agree, the TAU guidelines for narrative review require a table for the methods but will change this to only text if allowed. Reviewer B made same suggestion, the table has been removed and a paragraph has been inserted to discuss methods.

*Comment 2: Please define the abbreviation PPD once when firstly introduced*

Reply 2: Corrected.

**“However, there is no standardization regarding patient reported pads per day (PPD) with various sizes and types of male continence products available on the market, variable levels of patient activity, and inconsistent degrees of saturation before changing pads [10]”. Lines 88-91**

*Comment 3: Table 1 is blurry*

Reply 3: A new and improved table was created to address this issue.

*Comment 4: In table one, delayed drops/stream are described. How do you distinguish between OAB? Could a cough-provoked bladder overactivity be the cause? Please comment in the manuscript.*

Reply 4: Delayed in the manuscript context refers to coughs 3-4 as opposed to coughs 1-2 in the series of 4 ie early drops are synchronous with coughs 1 or 2 and delayed drops are synchronous with coughs 3 or 4. We've added the below sentence in the description of MSIGS grading to address timing of the observed leakage and how to identify cough provoked bladder overactivity.

**“The observed leakage must be synchronous with the cough as persistent leakage after the cough has subsided is indicative of cough induced detrusor overactivity.” Lines 113-115**

*Comment 5: Is there any correlation of the MSIGS with a validated questionnaire for SUI? Please comment.*

Reply 5: Not to our knowledge, this is now addressed in future directions.

**“Further validation of this grading scale is recommended as much of the existing literature is retrospective in nature and from a single institution. Multi-institutional efforts are needed to further validate MSIGS either by correlating with a validated SUI questionnaire, urodynamic findings or by confirming correlation with 24 hour-pad weight.” Lines 206-209**

*Comment 6: How do you ensure an adequate bladder filling for the test? How do you confirm the bladder is filled? Is there a threshold of bladder filling? How do you ensure that you do not underestimate the degree if this is not checked? Please comment in the manuscript.*

Reply 6: This is a limitation in the study. Could argue for catheter placement and retro-filling but otherwise we examine the SUI at functional bladder volumes. A paragraph was added in future directions addressing lack of standardization of the SCT.

**“Although MSIGS provides a standardized grading scale for interpreting the standing cough test, there is no standardization to the standing cough test itself. The International Continence Society (ICS) has standardized the cough stress test in the evaluation of female stress incontinence using the ICS-Uniform Stress Cough Test educational module. This module instructs on the performance, interpretation, and reporting of the CST in a standardized manner. The development of a similar educational module for evaluation of male stress incontinence would be useful in the dissemination of this invaluable diagnostic tool.” Lines 199-205**

*Comment 7: Please comment on which MSIGS severity grading was appropriate for the adjustable male sling and if there is a difference to the fixed slings. Can the adjustable sling applied according the test successfully to higher degrees of urinary incontinence? (Line 186 ff)*

Reply 7: Dorado et al did not use pre-operative MSIGS as a selection criterion for the ATOMS, however they did find failure rate when comparing pre-operative MSIGS 4 vs MSIGS 1 on multivariate analysis was higher with OR 3.412 [1.159-10.095] *p*-value 0.0244. The closest data point to compare this to fixed sling is the incremental increase in failure risk per incremental increase in MSIGS score with OR of 1.7 [1.2-2.4] *p*-value 0.005 (OR of 1.7 for MSIGS 1 and 6.8 for MSIGS 4). The authors do not feel comfortable drawing any

conclusions about higher success with ATOMS for higher degrees of incontinence compared to fixed sling based on these two findings from very different data sets.

*Comment 8: I suggest to rephrase your last sentence in the conclusion a bit more cautiously, since there is no broad validation of your test and some remaining open questions. (Line 211)*

Reply 8: Both the abstract and manuscript conclusions have been softened as per reviewer's suggestion, now reads as follows.

**“The MSIGS is a non-invasive, efficient, and cost-effective way to evaluate men with SUI. The in-office SCT can be quickly and easily adopted into any clinical practice and provides immediate objective information that can be used to better counsel patients on anti-incontinence surgery selection.” Lines 50-53 and lines 216-219**

Reviewer F:

*This is a literature review of the Male Stress Incontinence Grading Scale and provides a very nice overview of MSIGS, its utility and use in clinical practice and surgical treatment selection. There are a few very minor modifications that can make this manuscript stronger:*

*Comment 1: Within the Evaluation of SUI section, there is discussion about "less common" tests including urodynamics. Cystoscopy is also listed there; however cystoscopy is an indicated test for all patients undergoing SUI surgery based on the guidelines so this should not be listed as a less common procedure for SUI patients.*

Reply 1: Agreed, this is now corrected and reads as follows.

**“Other less common tests in SUI evaluation in men include urodynamics, and sphincter pressure under contraction (SPUC) using urethral profilometry profile.” Lines 122-123**

*2. Within the validity of MSIGS section, there is mention of the pilot study - it would be helpful to list the number of people included in the study (the N) so that readers can better contextualize these data.*

Reply 2: Agreed, this is now corrected and reads as follows.

**“During the pilot study, which included 62 consecutive patients who underwent MSIGS testing at initial clinic evaluation, a strong correlation was found between pre-operative MSIGS and pads per day ( $r = 0.74$ )”. lines 134-136**

*Comment 3: Anti-incontinence surgery is abbreviated as "AIS" but this is not a routine abbreviation. Would instead suggest that the authors stick with "SUI surgery" which is more common.*

Reply 3: Agreed, this is now corrected and reads as follows.

**“Multiple factors associated with anti-incontinence surgery failure have been identified. Shakir et al.” lines 142-143**

**“...MSIGS utility in evaluating SUI and its use as a predictor for failure following SUI surgery could further validate...” lines 184-185**

*Comment 4: Line 158 there is discussion of delay to surgery and postulation that this is because of uncertainty in how to stratify men's incontinence. This does not really make sense - most likely the delay to*

*SUI surgery is not related to difficulty with stratification, though I agree that people do struggle with stratification and this can be helpful to urologists trying to counsel patients and make treatment recommendations. I'd probably remove the reference to surgical delay and focus instead on how MSIGS is helpful for both patients and counseling physicians.*

Reply 4: The two sentences discussing time delay to incontinence surgery have been removed.