Journal Club 101 and Manuscript Best Practices

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1. Introduction

The basic tenant of peer review is fundamental to the process of developing and publishing evidenced-based data to move science forward. Peer review is simultaneously a privilege and an extraordinary responsibility with which we should all be engaged. The practice of peer review has become completely integrated and essential for validating our medical literature. For Urologists, formal training in the fundamentals of manuscript evaluation and productive review is an often-overlooked component of residency training. Despite the critical importance of manuscript evaluation prior to publication, even for those endeavoring into or already engaged in academic appointments, the skills required for successful participation in the peer review process is still rarely part of a formal curriculum. By exploring this chapter, the reader can enhance both review skills and translate these skills into manuscript composition to improve initial submissions and resultant journal acceptance.

1.1 History of peer-review

Descriptions of the peer-review process date back to Syria from approximately 900 AD in works describing means of a local council examining patient records to determine if a physician had performed standard of care therapies. [1] However, it would be centuries until the process aimed at improving manuscripts manifested. Indeed, in 1553 after the Spanish physician Servetus suggested that blood passed from the right side of the heart to the left through the lungs, John Calvin had him burned at the stake. Fueled by the innovation of the scientific method by Francis Bacon, the journal of the Royal Society of London, Philosophical Transactions, adopted a process of inspection of submissions by a select group of knowledgeable members which was the true dawn of our contemporary peer review process. Widespread dissemination of peer review of published literature did not gain traction until the 20 th century. Curiously, our steadfast exemplars, Science and The Journal of the American Medical Association, did not employ outside reviewers until 1940 and Lancet only began the process in 1976. As we will explore, the system is far from ideal and in recent years may have transgressed to more medieval times with penetrable aspects of the electronic system subject to fraud.

Our current system is designed to primarily provide integrity and accuracy in published material. Authors anticipate and deserve a fair and unbiased critique to improve their manuscript and correct any errors prior to publication. The entire system relies on the volunteer efforts of engaged stakeholders. The process of peer review is fundamental to most every decision we make in Urology, so it is rather staggering that in general many in our field know very little about the process and receive minimal or, more frequently, no formal training in this endeavor. The goal of this Core Curriculum material is to provide the appropriate knowledge base to attain a greater comfort with the peer review process and help increase participation critical to moving our evidence-base forward to optimize care for our patients.

1.2 What is a peer?

The International Committee on Medical Journal Editors (ICMJE) describes peer review as a continuation of the entire scientific process that should involve experts able to respond in a timely fashion and submit unbiased, constructive comments while keeping the content of the manuscript confidential.[2] In its most basic description, peer review is "the assessment by an expert, of material submitted for publication." [3] Naturally, the system has evolved to another level of complexity that potentially introduces bias and in select cases, has been subject to overt fraud.

1.3 Models of peer review

In general, there are three main models utilized by most current scientific publications. Naturally, each has its own proponents and detractors with a variety of nuanced variables added to the mix.[4] Also built into the system is the ability of the in-house editorial team to detect major flaws and triage the manuscript prior to dissemination for peer review as well as author's ability to promote the manuscript following publication with open review or social media commentary. [5] The primary models include the following structures:

- **Single-blind:** In this model, the authors are known to the reviewer but not vice versa
- **Double-blind:** In this situation, neither authors nor reviewers are identifiable to each other.
- **Open review:** This represents the most transparent option with both authors and reviewers known to each other.

1.4 Bias

Bias is defined as a systemic prejudice that prevents accurate and objective interpretation of scientific studies.[6] Bias may regard the content of the manuscript, confirmation that affirms the reviewer's beliefs, publication bias favoring positive outcomes, conservatism against innovative research, as well as the conflicts of interest described below. All efforts at impartiality should be undertaken, but as a human endeavor, peer review bias may be difficult to detect and mitigate.

1.5 Conflict of interest

Conflicts of interest may become evident in many ways ranging from competition in a space,

intellectual property, financial, and even to personal biases. With all the extreme sub-specialization in Urology it is highly probable that you as a reviewer will be familiar with the authors and the thesis of the manuscript. As a reviewer, it is at your discretion if you believe that such a conflict exists which will not allow the review to be completed without substantial bias. Transparency with the editor is paramount in such situations so an appropriate management can be promoted.

1.6 Fraud

Unfortunately, in the age of electronic submissions there has been ample opportunity to defraud the peer review process with several high-profile schemes with impersonation of reviewers uncovered, resulting in substantial security changes to the editorial systems. The fraud category would also include overt predatory behaviors such as breaching confidentiality, plagiarism, stealing ideas or holding a manuscript hostage while your competing publication moves forward. As a peer reviewer, it is an honor to be at the forefront of concepts in your area of expertise, and naturally everything we absorb may influence our future insights and directions. This is part of the “black box” of peer review that relies on your integrity as a reviewer to not abuse the privilege.

2. General concepts

With manuscript review, first we must define our goals, including your capacity to perform the tasks requested with respect for the deadlines provided. Thoughtful approaches to manuscript review have been opined by well-respected reviewers which can provide insight into the process.[7]

2.1 Peer expertise

You were chosen to provide a peer-review because of your recognized expertise with the topic of the manuscript. Occasionally the editors may not be completely aware of your primary interests and assign articles that are on the fringes of your practice or research agendas. If you are not confident in your capability to assist the authors then by all means, decline the offer of the review. In this setting, comments back to the editors indicating the reasons for declining the review will hopefully help them define your primary interests and focus review requests in this arena. The system of searching for reviewers by topic, prior publications, or personal knowledge in their area of expertise is replete with inaccuracies. In your regret, providing suggestions for alternative reviewers is extraordinarily helpful to the editorial cadre.

2.2 Time

Reviews are offered and accepted on a rolling basis, but in general all have a time allotment for completion of several weeks. If you are unable to provide the review in the time frame requested, then early decline will allow the editors to move along briskly to other reviewers and not delay the manuscript adjudication. Editors do not expect a reviewer to accept every review request and understand the need to decline these requests at times. If you are unable to perform the review it is very much preferred that you simply decline the review request via the link provided on the email as opposed to not replying which also prolongs the process of manuscript adjudication.

2.3 General review best practices

Always keep your goals as a reviewer central. The critiques you provide should improve the manuscript for the authors with the goal of publication, even if that does not involve the journal for which you are performing the review. As such, commentary should always be constructive. Even if the information is negative, attempt to provide some mitigation strategy for the authors to enhance their chances of improving the data presentation and discussion.

Careful review requires several views of the content. The first read may be brief and provide a general overview of the topic, hypothesis, methods, and general conclusions the authors are endeavoring to convey. It is entirely appropriate to make notes during this phase of the review which can begin to provide structure to your review and investigate points that are going to require further interrogation on subsequent reads. Reviewers may occasionally perseverate on early deficiencies, but on further reading, the content may come into context or be overshadowed by other, more fundamental deficits in the analysis.

The first read-through is an opportunity to shelve your personal bias and attempt to truly view the manuscript as a dispassionate observer. As discussed above, you may have competing or collaborative interests with the content. In the very small world of Urology, it is likely that you personally know the authors of the manuscript you have been tasked to review. In the world of ever-expanding technologies, you may also find yourself with a conflict of interest with the topic of the report. If the relationship to authors or content is one where you are unable to provide an unbiased review, now is an appropriate time to recuse yourself from further involvement with the process.

One of the primary issues that may become immediately apparent are differences in writing style or even language and grammar deficits. Although clarity in communication of ideas is critical, many of these stylistic issues can be overcome with the assistance of the editorial team. Certainly commentary, particularly for obvious errors that may have been overlooked by the authors, is appropriate. However, wordsmithing to alter the writing style to one you may be more comfortable with really does not have a place at this juncture.

Many publications will publish the reviews from accepted manuscripts. You are encouraged to explore the comments from the other members of the peer review cadre as they may illuminate aspects of the analysis you may have overlooked and will inform your future efforts at peer review.

As implied above, read the manuscript at least twice. The distractions that may preoccupy during the first view are often resolved or expanded during the second read.

Synopsis of general principles of manuscript review:

- **Define your goal as a reviewer**
    - **Critiques that will make this a better manuscript**
    - **Goal is assisting the author in publication of the data**

    - **Justify critiques to make them constructive**
- **Read it first before writing up your review**
    - **Aspects that initially pre-occupy your attention may get resolved later**
    - **Take notes**
- **No room for personal biases**
    - **Even if you think you can do better - this is not your time**
    - **Don't correct on writing style if differs from yours**
- **But if presentation is poor, say so**
- **Always read the other reviewers' comments afterwards**
    - **See if you were on target**
    - **Did they come up with something you missed?**

3.Structure of the review

There are many means of organizing your review, but the ones with the most impact for the authors often encompass both broad and granular information. Defining the structure in three components may center the information for easy access, particularly for the editors. **This three-component review includes a global summary, major comments, and then specific details.** The summary component is basically a short recap of what you took away from the manuscript with a synopsis of your perception of the author's hypothesis and major findings from the data. **Major comments include a "30,000-foot view" of the manuscript** where comments regarding the importance of the question in the context of the field, along with any major design flaws which may impact utility of the data despite the importance of the question, should be included. **Specific comments may be formatted in several ways that are equally valuable to the authors and editors and are a matter of your personal preference.** Some reviewers choose to number specific comments, others bullet points, and yet others include the sections for which they are commenting as a header. If the listing is consistent, each style has relative merits and should be at the discretion of the reviewer. **We have developed the content of this chapter to reflect assessment of each component of the manuscript as a header for the comments.**

The review always **culminates with an ultimate recommendation from the reviewer** which may range from acceptance, minor revision, major revision, or rejection. Clarity and justification for the final disposition of the manuscript are useful to both editors and authors.

Most journals will provide an option for **confidential comments to the editor** so that information you may not deem appropriate to reflect to the authors can be expressed. These comments can be particularly useful when there is uncertainty to the fate of the publication in the journal in question. Overall, providing context to the editor justifying your decision regarding the disposition of the manuscript is exceptionally valuable to place the data in context.

3.1 Synopsis of general structure for manuscript review:

- **Three component review**

    - **Summary-recap of hypothesis and findings**
    - **Major comments ("view from 30,000 feet")**
- **Major issues with design/design flaws**
- **Question the science**
    - **Specific comments**
- **Comments to authors**
    - **Comment on each individual section of paper as needed**
    - **Number or bullet point comments**
- **Easier for author to respond**
- **Easier for editor to evaluate response from author**
- **Comments to editor**
    - **Contextualize your findings and decision**
    - **Major flaws or concerns**
- **Final recommendation for disposition**

3.2 Specific commentary for authors

3.2.1 Title

Begin at the beginning. Does the title accurately reflect the content of the manuscript? It is completely reasonable to suggest changes to the authors, particularly if their title is expansive as longer titles are often difficult for readers to navigate.

- **Title**
    - **One sentence that describes the paper**
    - **Avoid lengthy titles when possible**

3.2.2 Abstract and Key Words

One should **consider the abstract as a mini manuscript that recapitulates the entirety of the findings**. This should be succinct and contain standard components including the purpose, methods, results, and conclusions. The benefits of reading a manuscript twice before completing a review is nicely reflected here as it is virtually impossible to adequately evaluate the abstract until the entire paper has been read. Each publication has a very defined metric and although outside the purview of this chapter, all the manuscripts that reach your desk have hopefully been vetted for compliance with the structural expectations of the publication. Also on the front page are the **list of key words that will be employed for indexing by the various services for literature retrieval**. The authors in general should avoid redundancy as the key words in the title are automatically indexed. The **Medical Subject Headings (MeSH) thesaurus** is a controlled and hierarchically organized vocabulary produced by the National Library of Medicine (NLM). MeSH is used for indexing, cataloging, and searching of biomedical and health-related information and includes the subject headings appearing in MEDLINE/PubMed, the NLM Catalog, and other NLM databases. Ensuring the key words are standardized provide the metrics that will optimize recognition of the

manuscript during literature searches. **The National Library of Medicine provides several systems for authors to optimize the use of appropriate terms including MeSH on Demand, a tool that can automatically identify relevant MeSH terms from text such as an abstract.**

- **Abstract**
    - **Should be succinct but be able to tell you about the paper**
    - **Think of it as a "mini-paper"**
- **Purpose: hypothesis or objectives**
- **Methods: broad description**
- **Results: succinct, includes main outcomes**
- **Conclusion: take away message**
- **Key words**
    - **Medical Subject Headings (MeSH) terms**
    - **Avoid redundancy - key words in the title are automatically indexed**

3.2.3 Introduction

Providing a landscape for the ultimate foreground of data is the ultimate purpose of the manuscript introduction. As a reviewer it is critical to **determine if the authors have provided an appropriate argument to justify embarking upon their course of study**. In essence, did the authors address a question of significance for the readership of the journal? Additionally, as a peer-reviewer facile in the study topic, did the authors utilize the appropriate references? Were there obvious omissions that may be fueled by alternative motives or inaccurate review of the background materials? Does the study address a knowledge gap that will propel the field forward? Did the aims of the study define this gap? There should be minimal editorializing regarding the data revealed in the study, but they should provide a sturdy platform to engage the audience and enhance interest in further reading. Lastly, the introduction is meant to introduce the topic, explain the gap in the literature and describe how this study will address this gap – this is distinct and should be briefer than what is seen in the discussion section of the paper.

- **Introduction**
    - **Did the authors explain the background and build an argument?**
- **Appropriate references used?**
    - **What was the gap or the rationale that prompted this study?**
- **Did their aims and objectives define the gap?**

3.2.4 Methods

Perhaps the most troublesome section for peer review is the methods section. Particularly with the advent of many innovative strategies to define large administrative data sets or employ novel means of assessing data, the complexity of determining the appropriate utilization of strategies is one that requires extra effort in today's literature. Overall, did they authors provide a description such that the study can be interpreted and replicated? The reviewer should determine if the study clearly defined

outcomes via use of appropriate means including validated instruments. Inclusion of language which indicates approval from the Institutional Review Board (IRB) is important to determine.

As mentioned above, in our current environment of mega-data and exploratory analyses and modeling, a **robust statistical plan and presentation is fundamental to assessment of the results and determination if the manuscript data met the appropriate endpoints. If the peer-reviewer is not facile with the statistical methods employed, which is the most encountered situation, then message that the manuscript would benefit from statistical review.** Many journals now engage a statistical review board to adjudicate these issues and guidelines have been developed specifically for Urology.[8] In general, statistical review should be ideally employed after the manuscript has passed the first round of reviews and appears to be moving towards publication to gather the highest yield from the biostatisticians and provide best utility for the authors. It does turn out that there are **several very common statistical mistakes that are made by authors which most peer-reviewers, regardless of their background, are able to assess. These include not adequately describing the statistical methods employed, not accepting the null hypothesis, reporting of multiple p values, use of interaction terms not included in the subgroup analysis, employing inaccurate descriptors of statistical significance, supplying tables with extraneous information, failure to categorize continuous variables, and use of outcomes that represent an inaccurate time to event** (Robert Siemens and Melissa Assel, personal communication).

- **Methods**
    - **& Were techniques well described?**
    - **Can the reader follow what they intended to do?**
    - **Is there enough information to reproduce the study?**
- **Stated what is primary and secondary outcomes?**
- **Did they specify use of validated instruments, questionnaires, special instruments?**
    - **Was their IRB aware of the study and provide approval to proceed?**
    - **Were appropriate statistics used?**
- **Power and sample size calculations?**
- **Can request statistical evaluation**

3.2.5 Results

The results presented should be straightforward and easy to follow. The reader should not be forced to delve deeply to find occult information. **As a peer reviewer, it is always prudent to double check a few of the data points to insure consistency throughout the manuscript and tables**. For example, do the sample sizes match for each of the groups? Presentation of the results should not include contextualization or editorialization of the data, just factual reporting. Assessment of the impact of the tables, graphs, and figures should also be performed to determine if they support or enhance the text or appear duplicative and extraneous. For example, data that is completely described in the body of the manuscript and is also presented in a table is often unnecessary and it

would be appropriate for a review to ask the authors to not use both options. **Reviewer commentary regarding the data presentation and utility of the figures is exceptionally valued.**

- **Results**
    - **Should present the data clearly**
- **Do the numbers add up (check of 1-2 data points)**
- **Should be straight forward**
    - **Did the data correspond to what was planned in the methods section**
    - **Avoid commentary or explaining the data**
    - **Do figures and graphs help? Are they linked appropriately within the text? More tables/graphs needed?**
    - **Not a time for discussion of results**
    - **Do results in Abstract match results in this section?**

3.2.6 Discussion

Finally, the discussion presents opportunity for the authors to describe how their data fills the gap outlined in the introduction and places the information in the context of current literature. A recap of both supportive and contrary findings and a highlight of the most important findings of the study would be expected at the beginning of the discussion. The discussion is not a place for study results to be introduced or discussed if not presented in the results section. **How their data will manifest change in scientific thought, clinical practice, as well as future research directions are standard and expected** components of the discussion and authors should be provided latitude to express how their outcomes fit in the field. This should be done with some discussion regarding how their outcomes compare to similar papers that have focused on the topic. It is important that prior papers that may agree and disagree with the authors' finding are discussed; this can be a challenge for younger reviewers who may not be as familiar with older literature on the topic. Also important, and a place that peer reviewers can key in on factors they may have overlooked, is the **author's identification of their perception of the strengths and weaknesses of the work**. How did they justify the data with the limitations identified? Lastly, just because authors are able to justify weaknesses in a paper does not give them a "free pass" in regard to that weakness.

- **Discussion**
    - **Summarize key findings (primary and secondary outcomes)**
    - **Context for data**
- **Did their data answer the questions put forth in the aims?**
- **How do their outcomes fit with their hypotheses?**
- **How do their outcomes fit with the literature?**
- **What does this study add to the literature?**
- **Effects on care?**
- **Future research?**
    - **Not a place to introduce new data**

    - **Identify strengths and weaknesses of work?**
- **Justify or address weaknesses**

3.2.7 Conclusions

The conclusions should succinctly and powerfully transmit the study findings in the context of their significance. The authors should avoid just repeating the results obtained but should comment on how they met the objectives and filled a gap to enhance the literature.

- **Conclusion**
    - **Major take home message**
    - **Did the conclusion answer the study's objectives?**

3.2.8 Figures and tables

Figures and tables are critical components which should be carefully evaluated by the reviewer. As with statistical methods, guidelines have been developed that assist with appropriate conveying of information such that the study results are clear and complete.[9] Labels and legends should be clear, and graphs should provide an immediate visual impression of the data. Figures and tables are not meant to recapitulate data that is already presented within the text of the manuscript. They should be complimentary to the text allowing for easier presentation of data/results (e.g., consort diagram to follow how patients progressed over the timeline of a study, a table showing patient demographics) or demonstrating trends with figures, graphs, etc.

- **Figures/Tables**
    - **Appropriate number**
    - **Enhance paper, not just duplicative of data**

3.2.9 References

References should be complete and include both supportive and detracting manuscripts. **A brief review to determine if there is a major omission is a high-priority reviewer task**. Often, if the reviewer is not completely familiar with all the contemporary literature, a brief literature search will be useful to ensure contemporary manuscripts, which may use similar data sets or draw disparate conclusions, are included.

- **References**
    - **No selective use to strengthen argument**
    - **Proper interpretation of references listed**

4. Final thoughts

Manuscript review is an amazing opportunity and concomitant profound responsibility to move Urology forward. Journals are ever iterating the process to improve transparency for the authors and decrease burden for the reviewers. We must all participate in the process and strive to enhance our evidence base as ultimately it is our patients who most heavily rely on the peer review process.

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