WCS 2017
47th WORLD CONGRESS OF SURGERY

Writer’s Workshop

Sponsored by
World Journal of Surgery
International Society of Surgery / Société Internationale de Chirurgie
Springer Science+Business Media

Congress Center Basel
Basel, Switzerland
August 15-17, 2017
TABLE OF CONTENTS

Agenda ................................................................. Pg. 3

Session 1 ................................................................. Pgs. 4-27

Session 2 ................................................................. Pgs. 28-62

Session 3 ................................................................. Pgs. 63-76

Academic Surgery: The Scalpel and the Pen .............. Pgs. 77-87

Sample Manuscript .................................................... Pgs. 88-104
AGENDA

Congress Center Basel
Messeplatz 21
4058 Basel, Switzerland

**Session 1:**
Tuesday, August 15, 2017
7:00am - 8:15am
Meeting Area: Foyer, 2nd Floor

**Session 2:**
Wednesday, August 16, 2017
7:00am - 8:15am
Meeting Area: Foyer, 2nd Floor

**Session 3:**
Thursday, August 17, 2017
7:00am - 8:15am
Meeting Area: Foyer, 2nd Floor
SESSION 1

Getting started: so you have an idea - what next?

- Types of manuscripts
- Posing the correct question
- Defining methodology
- Collecting the data
- Organizing the data
- Choosing statistical methods and data analysis
- Identifying an audience (best meeting, best journal)
- Authorship team
- Trial registration
- RCT reporting

Exercise: Writing the abstract

Articles:
2. CONSORT statement 2010 flow diagram - www.consort-statement.org
3. Trials registration - https://ClinicalTrials.gov
6. WJS sample article without abstract
Objective: Evidence-based surgery is predicated on the quality of published literature. We measured the quality of surgery manuscripts selected by peer review and identified predictors of excellence.

Methods: One hundred twenty clinical surgery manuscripts were randomly selected from 1998 in 5 eminent peer-reviewed surgery and medical journals. Manuscripts were blinded for author, institution, and journal of origin. Four surgeons and 4 methodologists evaluated the quality using novel instruments based on subject selection, study protocol, statistical analysis/inference, intervention description, outcome assessments, and results presentation. Predictors of quality and impact factor were identified using bivariate and multivariate regression.

Results: Oncology was the most common subject (26%), followed by general surgery/gastrointestinal (24%). The average number of study subjects was 417; the majority of manuscripts were American (53%), from a single institution (59%). Eighteen percent had a statistician author. Mean number of citations was 128. Surgery manuscripts from medical, compared with surgery journals, had better total quality scores (3.8 vs. 5.2, P < 0.001). They had more subjects and were more likely to have a statistician as coauthor (43% vs. 10%, P < 0.001), multi-institutional, international collaboration (30% vs. 8%, P < 0.001), and higher citation index (mean: 350 vs. 54, P < 0.001). They were more often foreign (70% vs. 40%, P < 0.001). Independent predictors of quality were having a statistician coauthor, study funding, European origin, and more study subjects. Quality assessment using our instruments predicted the number of citations after 10 years (P < 0.01), along with having a statistician coauthor, international multi-institutional collaboration, and more subjects.

Conclusion: The quality of surgery manuscripts can be improved by including a statistician as coauthor, with efforts directed toward implementing multi-institutional/interdisciplinary trials. Peer-review across journals can be standardized through the use of instruments measuring methodologic and clinical quality.


Methods

Manuscript Selection

This study was a systematic review of the literature with a double blinded, randomized sampling schema. A total of 120 manuscripts were selected from 3 surgery and 2 medical journals that had the highest impact factors in their respective fields. All manuscripts were published in 1998. To qualify for the study, they had to focus on clinical therapeutics in surgery. All manuscripts about basic science, animal trials, editorials, invited reviews, case reports, letters to the editor, summary of novel surgical techniques, and commentary were excluded. A power calculation was performed: to detect a 20% difference in total quality score with 90% power and an alpha of 0.05, a total sample size of 120 manuscripts was required. All eligible surgery manuscripts from the journals selected were identified for potential inclusion. A random number generator was used to select 30 manuscripts from each of the 3 surgery journals and 15 manuscripts from each of the 2 medical journals. A total of 90
manuscripts were extracted from the surgery journals, and 30 from the medical journals.

The manuscripts were then blinded for author, institution, country of origin, and journal, reported funding source, whether one of the authors was a statistician, as well as the possible presentation of research findings at a scientific meeting. No evaluators were authors or had close ties to any study manuscripts (Fig. 1).

Scoring
Four methodologists with training in health services research and clinical study design, and 4 academic general surgeons evaluated the quality of the manuscripts using 2 novel instruments (see Appendix, Supplemental Digital Content 1, http://links.lww.com/SLA/A2). Each manuscript was scored by 2 methodologists who independently assigned a score using a methodologic instrument, and 2 clinicians who independently assigned a score using a clinical instrument. Once familiar with the instrument, the evaluators completed a manuscript review in 30 to 45 minutes. Interrater agreement was tested with a $\kappa$ statistic. For seminal shared questions, agreement among methodologists ($\kappa = 0.81$) was substantial and appeared better than among clinicians ($\kappa = 0.33$); overall, there was moderate interrater agreement between methodologists and clinicians ($\kappa = 0.52$). The methodologists and clinicians then had to resolve discrepancies in scoring within 1 point for each item on their instrument. The methodologic and clinical scores were combined to create a total quality score; the lower the score, the better the perceived quality of the manuscript.

Methodologic Scoring
Methodologic evaluators were asked to score the study based on the effectiveness of the study design, the quality of the statistical analysis, and the tests of inference. Items on the instrument included how well the inclusion and/or exclusion criteria for study subjects was described, the appropriateness of the control group, how well patients or providers were "blinded" to treatment assignments, and the statistical analysis (ie, study design, choice of study population, appropriate statistical techniques employed, and use of multivariate analysis to account for possible confounders).

Clinical Scoring
Clinical evaluators were asked to score manuscripts based on a number of clinically relevant criteria. They determined how well the characteristics of the study population were described, and whether there were significant characteristic differences between the cases and controls that could affect the outcome of the study. They also were asked to score the effectiveness of the study protocol (ie, how well were the main therapeutic interventions in the study defined or described, and how reliable was the assessment of outcomes), and the presentation of the results and conclusions (ie, how well were statistical tests used to assess outcomes, and how well were they presented). Finally, evaluators were asked to rate the overall clinical significance of the study results, ranging from "Not
at all important for clinical practice" to "Extremely important for clinical practice."

Independent Variables

Independent variables of manuscripts included the clinical subject (general surgery and benign GI; oncology; endocrinology, otolaryngology and breast; vascular, transplant, and cardiothoracic surgery; trauma and critical care; and other [pediatrics, urology, plastics, orthopedics, gynecology, and neurologic surgery]); country of origin (US, Europe, Japan, Western Hemisphere [excluding US], and all other); funding source (National Institutes of Health [NIH], non-NIH, and unfunded); institutional affiliation (academic medical center, community/private hospital, Veterans Administration Hospitals/Armed Forces, commercial, and other); research collaboration (single institution, multi-institution/single country, multi-institution/international); statistician as a coauthor; number of study subjects; level of evidence based on study design (levels 1–5, adapted from the US Agency for Health Care Policy and Research); and whether the manuscript was directly submitted for publication or whether it was submitted for publication after the results were presented at a scientific meeting.12

Outcome Variables

The primary outcomes of interest were: (1) methodologic score (range, 1 [best]–4 [worst]), (2) clinical score (range, 1 [best]–8 [worst]), and (3) overall total quality score (range, 1 [best]–4 [worst]). Ten years were allowed to elapse between year of publication (1998) and calculation of citation index for each manuscript (2008), to measure whether the total quality score predicted the number of times the manuscript was cited over the decade.

Statistical Analysis

Descriptive statistics were calculated. Bivariate analysis of the independent variables by the methodologic, clinical, and total quality scores were performed by a χ² statistical analysis for categorical variables and analysis of variance for continuous variables. Multivariate linear regression models were used to adjust for significant independent variables based on bivariate analyses to identify independent predictors of the total quality score. Data analysis and management were performed using SPSS Version 14.0 (Chicago, IL). All tests were 2-sided, with statistical significance set at a probability value of P ≤ 0.05. This study was deemed to be exempt from Institutional Review Board approval at our institution.

RESULTS

Manuscript Characteristics

Overall, the most common subject was oncology (26%), followed by general and GI surgery (24%), and vascular, transplant, and cardiothoracic surgery (23%) (Table 1). Vascular, transplant, and cardiothoracic surgery was the most common subject in medical journals (43%). On average, studies published in medical journals had over 3 times the number of study subjects than those published in surgery journals (891 vs. 296, P < 0.001). They were 4 times more likely to have a statistician coauthor (43% vs. 10%, P < 0.001). Overall, manuscripts published in medical journals had better methodologic, clinical, and overall quality scores than those published in surgery journals (all P < 0.001) (Fig. 2).

Academic medical centers produced the majority of manuscripts (74%); most manuscripts in surgery journals came from a single institution (71%), whereas most in medical journals were multi-institutional (77%, P < 0.001). Sixty percent of manuscripts in surgery journals were American, whereas 63% in medical journals were European. The majority of manuscripts in surgery journals were unfunded (90%), whereas most in medical journals were funded (77%, P < 0.001). Manuscripts from surgery journals were more likely to be associated with an academic medical center (76% vs. 70%, P < 0.001); medical journals were nearly 4 times more likely to publish international collaborative trials (30% vs. 8%, P < 0.001). Surgery manuscripts in medical journals were cited nearly 7 times more often than those in surgery journals (350 vs. 54, P < 0.001).

Unadjusted Factors Affecting Overall Total Score

Manuscripts with more study subjects had better overall scores (mean, 4.30) compared with manuscripts with fewer subjects

<table>
<thead>
<tr>
<th>Table 1. Summary of Manuscript Characteristics (N = 120)</th>
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<tbody>
<tr>
<td>Manuscript Characteristics</td>
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<tr>
<td>Manuscript Characteristics</td>
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<td>A</td>
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<td>B</td>
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<td>C</td>
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<td>D</td>
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<tr>
<td>E</td>
</tr>
<tr>
<td>Topic</td>
</tr>
<tr>
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<tr>
<td>General surgery/GI</td>
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<td>Endocrine/breast/ENT</td>
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<td>Trauma</td>
</tr>
<tr>
<td>Other</td>
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<td>Number of study subjects</td>
</tr>
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<td>Statistician</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Institution</td>
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<td>Community/private hospital</td>
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<td>VA/Armed forces</td>
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<tr>
<td>Commercial (pharma)</td>
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<td>Other</td>
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<td>Collaboration</td>
</tr>
<tr>
<td>Multi-institution</td>
</tr>
<tr>
<td>Multi-institution, international</td>
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<td>Western Hemisphere (excl. United States)</td>
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<td>Other*</td>
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<td>Manuscript</td>
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<tr>
<td>Derived from presentation</td>
</tr>
<tr>
<td>Citation</td>
</tr>
</tbody>
</table>

*Cardiothoracic Surgery.

Includes: Asia (excluding Japan), Russia, Africa, Australia, and New Zealand.

NS indicates not significant; CT, computed tomography; ENT, ear, nose, throat.
Having a statistician as a coauthor resulted in a significantly better score (4.11 vs. 5.05, \( P < 0.001 \)), as did international, multi-institution collaborations compared with single country, multi-institution, and single institution studies (4.22 vs. 4.83 vs. 5.05, respectively, \( P < 0.001 \)). Manuscripts originating from Europe also were found to have better scores compared with the United States (4.45 vs. 5.12, \( P < 0.01 \)). Studies that were unfunded had significantly worse total quality scores (5.17), particularly compared with non-NIH funded studies (4.06, \( P < 0.001 \)).

**Adjusted Factors Affecting Overall Total Score**

Variables found to be significant on bivariate analyses were included in a multivariate regression analysis to identify independent predictors of clinical and methodological quality, as measured by total scores (Table 3). Independent predictors of better scores were a larger number of study subjects, the presence of a statistician as a coauthor, and Europe as the country of study origin; having no funding for the study was an independent predictor of a worse quality score.

**Adjusted Factors Associated With Citation Index**

Ten years after the manuscript publication, several factors were identified on multivariate regression analysis to be independently associated with a manuscript's citation index (Table 4). Independent predictors of a higher citation index were having a larger number of study subjects, the presence of a statistician as a coauthor, and an international multi-institutional collaboration. A better total quality score also was a strong independent predictor of a higher citation index (\( P < 0.01 \)).

**Impact of Level of Evidence on Quality Scores and Citation Index**

Level 1 and 2 studies were associated with better total quality scores compared with level 3 to 5 studies (3.61 and 4.17 vs. 5.29, respectively, \( P < 0.001 \)), and this accounted for 50% of the variation observed in total quality scores. Level 1 and 2 studies also were associated with higher citation indices compared with level 3 to 5 studies (386 and 87 vs. 68, respectively, \( P < 0.001 \)); this accounted for 28% of the variation observed in manuscript citation index.

**DISCUSSION**

This study measured the quality of surgery manuscripts utilizing 2 novels, clinical and methodologic instruments in a double-blinded randomized sampling schema. It assessed whether standardizing peer review with a dedicated instrument can project a manuscript's citation index a decade later, and thus, anticipate its impact over time. Our study demonstrated an association between better quality scores from clinical and methodological evaluators and a larger number of study subjects, as well as coauthorship by a statistician, European authorship, and an external funding source. Peer-reviewed surgery manuscripts published in medical journals had better quality scores compared with those published in surgery journals.

The magnitude of the number of subjects is generally regarded to be a positive indicator of reliability in studies, as determined by a power calculation. A reliable power calculation is an important part of maintaining methodologic rigor.\(^{13}\) Ko et al analyzed 71 randomized, controlled studies published over 3 years in 4 surgery journals, and found that only 11% of these contained a power calculation.\(^{14}\) Merenstein et al evaluated 170 articles published in family medicine journals. He found that most articles were cross-sectional surveys, and only 6 were randomized controlled trials. The majority of articles did not meet established criteria for relevance and validity. The ones with a more rigorous study design had a greater impact. This correlation is to be expected, as rigorous design often requires larger study samples.\(^{15}\) The present study confirms that adequately powered studies had better clinical and methodologic scores. Caution needs to be taken, though, as in too large a sample, statistical differences may be found without clinical
<table>
<thead>
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<th>Manuscript Characteristics</th>
<th>Method Score</th>
<th>Clinical Score</th>
<th>Total Quality Score</th>
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</thead>
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</tr>
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<td>B</td>
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<td>C</td>
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<td>D</td>
<td>2.08</td>
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<td>&lt;0.01</td>
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<td>5.09</td>
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</table>

*Cardiothoracic Surgery.
*Includes: Asia (excluding Japan), Russia, Africa, Australia, and New Zealand.
NS indicates not significant.

significance; therefore, performing power calculations is methodologically sound whenever possible.

Many reports in the literature have confirmed the need for a high statistical standard. Statistical complexity has been on the rise in surgery literature, and yet, major statistical discrepancies in P-values are found in renowned journals. Berle et al that detailed peer review is necessary even when dedicated statistical methodologists are not available for the manuscript review process. Journal editors value rigorous statistical reviews, but finding appropriately trained methodologists is often difficult. To balance the need for a strong statistical review in the setting of limited resources, Rigby devised a list of criteria to meet a statisti-
TABLE 3. Multivariate Analysis of Factors Associated With Total Quality Score

<table>
<thead>
<tr>
<th>Explanatory Variables*</th>
<th>B Coefficient (Total Score)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
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</tr>
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<td>2nd</td>
<td>-0.27</td>
<td>&lt;0.01</td>
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<tr>
<td>3rd</td>
<td>-0.18</td>
<td>NS</td>
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<tr>
<td>Nonfunded</td>
<td>0.33</td>
<td>&lt;0.05</td>
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</tbody>
</table>

*Reference comparisons were Number of Study Subjects (1st quartile), No Statistician, United States, NIH-Funded. NS indicates not significant.

TABLE 4. Multivariate Analysis of Factors Associated With Citation Index

<table>
<thead>
<tr>
<th>Explanatory Variables*</th>
<th>B Coefficient (Citation Index)</th>
<th>P</th>
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</thead>
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<td>Score</td>
<td>-57.6</td>
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</table>

*Reference comparisons were Number of Study Subjects (1st quartile), No Statistician, Single Institution. NS indicates not significant.

Researchers generally use the Science Citation Index impact factor to portend how well their article influenced other authors. The impact factor is a measure of how many citations a article receives over time, and it has been validated multiple times.

In the present study, the novel methodologic and clinical instruments employed to evaluate the quality of manuscripts independently predicted the manuscripts' impact factors over 10 years.

This study has several potential limitations. The novel instruments were developed specifically for application in the field of clinical therapeutics; therefore, manuscripts in the growing field of basic science (ie, molecular biology and genetics) would require modifications. They were designed for practical use in the peer-review process, and therefore were necessarily brief. As a result, they might not capture all predictors of clinical and methodologic quality. The manuscripts chosen were a decade old to allow calculation of a mature citation index. Although there have been many changes in the state of surgical science, we believe that the findings of this study are applicable today, and could be reproduced with contemporary manuscripts. Lastly, the scoring instruments are only as good as the reviewers using them, with their respective funds of clinical and methodologic knowledge.

Scientists have sought to identify factors that characterize quality medical literature and to appraise the validity of those indicators. Frequent shortcomings of peer-reviewed publications include failure to report randomization of study patients or presenting data in a convoluted manner.

The quality of clinical surgery manuscripts can be evaluated using standardized instruments assessing both clinical and methodologic rigor. Employing such standardized instruments would ease and homogenize the peer-review process, improve the quality of published manuscripts, and potentially help raise journal impact factors. Such instruments would bring transparency to the review process and help authors understand how to improve their submissions. In the current era of evidence-based medicine, there needs to be constant awareness of the quality of the published literature, which is by no means uniform. A prospective study comparing the current system of peer review with instrument-driven manuscript evaluation could be undertaken to measure the relative effectiveness of the 2 methodologies. Finally, instruments like these can be used in medical and graduate medical education (ie, journal clubs), so that students and residents develop a discerning eye for what constitutes good science.

ACKNOWLEDGMENTS

The authors thank the following contributors for their help in the acquisition of data: Michael Farrell, MD, Department of Medicine, Medical College of Wisconsin, Milwaukee, WI; Richard Gus-
berg, MD, Department of Surgery, Yale University School of Medicine, New Haven, CT; Barbara Kinder, MD, Department of Surgery, Yale University School of Medicine, New Haven, CT. Dr. Sosa would like to acknowledge the following contributors to the creation and validation of the instrument: Neil R. Powe, MD, MPH, MBA; Eric Bass, MD; Gregory Buckley, MD; David Cromwell, MD; Sanziana Roman, MD; Eric Desmond, JD, MSEL; Vincent Gott, MD; Steven Yang, MD.

REFERENCES

CONSORT 2010 Flow Diagram

**Enrollment**

- Assessed for eligibility (n= )
  - Excluded (n= )
    - Not meeting inclusion criteria (n= )
    - Declined to participate (n= )
    - Other reasons (n= )

**Randomized (n= )**

**Allocation**

- Allocated to intervention (n= )
  - Received allocated intervention (n= )
  - Did not receive allocated intervention (give reasons) (n= )

- Allocated to intervention (n= )
  - Received allocated intervention (n= )
  - Did not receive allocated intervention (give reasons) (n= )

**Follow-Up**

- Lost to follow-up (give reasons) (n= )
- Discontinued intervention (give reasons) (n= )

- Lost to follow-up (give reasons) (n= )
- Discontinued intervention (give reasons) (n= )

**Analysis**

- Analysed (n= )
  - Excluded from analysis (give reasons) (n= )

- Analysed (n= )
  - Excluded from analysis (give reasons) (n= )
ClinicalTrials.gov is a registry and results database of publicly and privately supported clinical studies of human participants conducted around the world.
Understanding the Peer Review Process

Robert J.S. Thomas

Peter MacCallum Cancer Centre, Melbourne, Australia

Peer review of scientific literature is a time-honoured process with a long history. To paraphrase Reiman, "It is hard to imagine how we, (sic. journal editors) could get along without it." However, despite the widespread espousal of the need for an evidence base for scientific research and publication, paradoxically, the process for determination of the value, integrity and originality of the results of that same scientific research, i.e., peer review, lacks a credible evidence base and is controversial to say the least. The International Congresses on Peer Review and Biomedical Publication has helped to remedy this situation, and much of the recent literature concerning peer review relates to the proceedings of these congresses.

The uncertainty, particularly as to the methodology of review, has led to great variability in the process of review in medical journals. Most medical/scientific publications use an external review process, and some of the issues surrounding this will be discussed. It is recognised that some resource-rich publications may conduct an in-house review system with different criteria and methods of evaluation of articles. A critical part of the review process relates to detection of misconduct, fraud and plagiarism, often only illuminated by an alert, informed and perceptive reviewer. This important matter will be the subject of a separate presentation.

The issue of anonymity of reviewers and authors is a matter of considerable debate. Journals vary in the attitude to anonymity. Generally it is accepted that anonymity of reviewers allows an honest appraisal of a submission without fear of exposure, particularly important with high-profile authors. There is a belief that anonymity helps to maintain the reviewer list, but this is not universally accepted. Reviewers concern about their opinions being used against them are probably misplaced, as it is the editors who have the responsibility for publication and bear the flak for that decision. The main argument for disclosure is the belief that the review process should be open from an ethical point of view and that more thoughtful reviews are obtained because of the openness of the process. It is also of value in exposing conflicts. This argument is not resolved, and individual editors take their own views on this matter. In general, many reviewers remain anonymous. Interestingly, all reviewers like to hear the responses of other reviewers, and these are usually distributed to the other reviewers and, of course, to the authors of rejected articles though often with some judicious editing.

The second element of anonymity and peer review relates to the question of whether the reviewer knows the identity of the author(s) or the article they are reviewing. The so-called blinded review may give a sense of fairness to the process, with avoidance of prejudgement in relationship to the origin of the article and the authors. However, it has been assessed that reviewers guess the origin of the article about 30% of the time. This type of blind review, however, seems a reasonable way of avoiding at least some conflicts of interest.

The final issue in relationship to transparency of the review process relates to the total exposure of the process to scrutiny by Internet access. Here, the submitted articles and reviews are placed on the Internet for public scrutiny prior to acceptance. There is the possibility of interaction between reviewer(s) and authors. There can be continuing modification of the article until it reaches acceptance for formal publication. This type of methodology has many obvious benefits but does add to the complexity of the publishing process and requires time and resources to manage the various interactions that might occur from public exposure.

However, the question of anonymity is simple compared with the problems of the quality of reviewers.
themselves. What makes a good reviewer, can reviewers be taught to review, and how do editors deal with the problem of two competent reviewers producing contradictory reports are ongoing questions for all editorial boards. Taking the question of what makes a good reviewer first; this would be easier if there was information available as to how the individual reviewer does the job. It is likely that considerable variation occurs. Studies have shown that some reviewers make a judgement about an article very early on then look for evidence to support that judgement. Others will be more measured and try to educate and a third group that had a single, face-to-face teaching programme and completed a total of 77% of the offered reviews, with a final number of 156 completing 3 reviews. The “self-taught” group completed 1 review, were sent a training pack and then completed a second review and a final review. A total of 55% of that group finished their 3 reviews. Then there was the third group who had face-to-face teaching after completing 1 review. They then completed a second and third review. Despite this well-worked-through study, there was little difference between the 3 groups in terms of review quality. Argument can be made that the degree of teaching was inadequate or not prolonged enough and it was only on a one-off basis. At the end of the day, better education for reviewers on a continuing basis with feedback is likely to improve the quality of the review process.

In a British Medical Journal study of 420 manuscripts and a total of 690 reviews, the only significant factors associated with high-quality reviews were:-

1. Training in epidemiology and/or statistics
2. Possibly an age between 40 and 60 years
3. Longer time taken for the review—up to 3 hours—although a longer period in this did not add to review quality. There is also the suggestion that the reviewer being based in North America results in a better review also.9

So with the problems of understanding about the review process and the lack of evidence-based education for reviewers, it is well understood how the handling editor is confronted with variable reviews of the same article. Each editor deals with it in his or her own way. More reviews?

A particular issue relates to the reviewing of the quality of statistics; there maybe scientific disagreement amongst professional statistical reviewers. There is also a problem of incorrect calls by reviewers; that is, the reviewers state that the statistics in the paper are inadequate or incorrect, but this does not stand up to further scrutiny.10

Electronic management of the editorial process has introduced particular issues for editors. It is sometimes difficult to access lists of reviewers, and the way the list of reviewers is compiled varies with different systems. Electronic management demands accurate keyword allocations, but these are often not perfect. Extraordinarily, the statistics of reviewing are very common across many different journals. About 30% of reviewers decline an invitation to review. It does not matter how this invite is made, whether it be electronically or electronically with a warning, or by other methods.

The ongoing issues in relation to peer review are still significant. The argument about whether we should be reviewing articles with independent peers is unresolved. Depending on the journal’s resources, an in-house review team might deal with much of the reviewing requirements. The issues of anonymity, blindedness, bias, fraud and misconduct are always there in the review process. At the end of the day, the comment of Kassirer6 is still applicable today: “Peer review, crude, understudied, but indispensable.” It must always be remembered that the peer review process as we understand it today relies on the availability of good citizens who are willing to give up limited amounts of spare time to help the scientific community publish in an organised and legitimate manner.

REFERENCES

INTRODUCTION

The scientific journal impact factor, developed and owned by the Institute for Scientific Information (ISI) was first mentioned in Science in 1955 by Eugene Garfield, and first applied in 1969.1 In the past 35 years this score has become the single most important "score" associated with scientific journals. In this essay we will look at the world of scientific, technical and medical journals, describe the impact factor and how it is calculated, and consider some alternative methods of rating the importance and relevance of a surgical publication.

WORLD OF STM JOURNALS

The world of scientific, technical, and medical (STM) journals is huge. There are approximately 16,000 STM journals worldwide. Approximately 100 new journals are launched each year. 1.2 million new articles are published annually, and the revenue from these journals generates approximately five billion dollars annually. The two largest publishers in the market, Elsevier and Springer, account for about one-third of this business, and the next eight publisher's together account for the second third of the business. Smaller publishing houses, including university presses and societies that publish their own journals account for the bottom third.

The U.S. Library of Medicine covers 4300 biomedical journals in the Index Medicus, Medline and through their search engine PubMed. This database contains nearly 12 million articles. The Institute for Scientific Information (ISI) was started in 1958 by Eugene Garfield and covered 200 journals in the current contents of chemical pharmaco, medical and life sciences. The science citation index, based on 562 journals was first published in 1961.2 By 1998 more than 8,000 journals were indexed in 35 languages. The ISI covers 7,000 STM journals in its publications entitled "Current Contents" and the "Journal Citation Report." The ISI indexes more than 812,000 articles each year.

Based on this thorough coverage of the landscape, the ISI attempted to create a method of ranking these journals based on the frequency with which articles published in that journal were cited by others. This became known as the journal impact factor and was first calculated in 1969 for the journals tracked by the ISI. The journal impact factor is calculated by determining the number of citations in any particular year for a given journal of articles published in the two prior years, then divided by the total number of articles published in those two years (Fig. 1).

The impact factor has been used to rank the quality of a particular journal, and used in many countries to assist promotion committees in determining the quality of a faculty member's academic work. While such uses are convenient, there are certain limitations to this use of the impact factor. First, because the impact factor only looks two years retrospectively, many "classic" articles are ci-
Increasing frequency of link out

Figure 2. Of Springer surgical journals, there is no correlation between journal impact factor and the frequency of electronic access through PubMed.

With a much more limited audience also appear in the top 10 for reasons described in the previous paragraph. A second way of looking at the impact factor includes an immediacy calculation. This score is based on citations in a particular year for articles published that same year. This usually is an indication of what fields and what journals are hot. Currently, Obesity Surgery has a very high immediacy score. In the early days of laparoscopic general surgery, Surgical Endoscopy had a similar high immediacy score.

There are several other methods used to calculate the importance of a journal including "link out" data from the National Library of Medicine, The Faculty of 1000, from the Current Science Group, and Levels of Influence as popularized by Cameron Abassi in the British Medical Journal. The link out data from National Library of Medicine's, Entrez PubMed website determines the number of times (absolute) a link provided from the abstract is utilized to download the full text article, or other information is obtained relevant to that abstract. It is the best surrogate marker for the number of times a journal article is downloaded. These data are valuable to libraries, perhaps more so than impact factor, as it will allow librarians to determine which of their many journals are frequently used by their clients (3). In this vein, the World Journal of Surgery (WJS) leads the 14 Springer surgical journals in the PubMed link out data, (Fig. 2) but has an impact factor less than Diseases of the Colon and Rectum, another popular Springer surgical journal.

The Faculty of 1000, launched in 2001, provides biological scientists an instrument to identify the most important papers in their field as chosen by their peers. This service has become popular in the basic sciences,
but has not spread yet to the clinical sciences to any significant extent. This tool is a literature awareness tool. It is a continually updated online guide to the most important papers within a given field. It highlights the papers rather than the journals and offers consensus recommendations from leading scientists. It offers a qualitative rating of individual papers by the author’s peers using a numerical evaluation system, thus complementing the journal impact factor (4).

A deputy editor of the British Medical Journal, Cameron Abassi, described a method of ranking papers looking at their influence. Influence is defined as a paper which changes landscape. The influence is divided by Dr. Abassi into six levels. Level one, the highest level, is one in which “something” changes because of the published article. Level two influence sets an agenda or legitimizes an issue. Level three influence is a paper which is being followed, an example of leadership. This might be most relevant to surgical papers describing a new innovation. Level four influence are those papers being quoted and cited. Level five influence are those articles being paid attention to, and level six influence are those papers that are known about. This method of determining the influence of a particular article is still embryonal, and has not been used except in concept. Nonetheless, it provides an appealing alternative to the limitations of scoring a journal based on its impact factor.

In summary, the quality of a surgical journal and each individual contribution is fundamentally dependent upon responsible peer review, not the impact factor. As said best by Sidney Brenner, “what matters absolutely is the scientific content of a paper and nothing will substitute for either knowing it or reading it.” (Brenner S. Nature 1995; 375:624).

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4. Faculty of 1000 www.f1000medicine.com.
Antibiotics as First-line Therapy for Acute Appendicitis: Evidence for a Change in Clinical Practice

Introduction

Acute appendicitis is a most common surgical disorder and is still a clinical challenge [1, 2]. Appendectomy as treatment was introduced around 1880 and became standard therapy during the 20th century. However, interest in antibiotic therapy as a possible primary treatment increased during the last decade [3–6], although this is not a novel thought [7]. Four randomized controlled trials comparing antibiotics with appendectomy in adults with acute appendicitis have been published [8–11]. Three of these studies show similar results, with initial recovery for 88–95% of patients treated with antibiotics [8–10]. The recurrence rate in our previous study on unselected adult patients appeared to be 10–15% after 1 year in patients treated by antibiotics, with fewer major complications such as abscess formations, reoperations, and small bowel obstructions.

However, promising results from randomized trials do not automatically predict reproducible outcome in everyday clinical practice. The first randomized study invited only men between 18 and 50 years old, with only around 20% of eligible patients included [8]. This indicates low external validity and low generalizability. Other studies, included both sexes but did not report the number of excluded
patients [10, 11]. In our own study, based on unselected men and women, the randomization procedure allowed surgeons on charge to violate the intention-to-treat allocation, which may create bias, although all eligible patients were included in the final analyses [9]. Thus, cited randomized studies and several retrospective reports indicate that antibiotic therapy is safe and may represent an effective first-line treatment of acute appendicitis, although with unknown long-term risk of recurrence or other complications [12–15]. The aim of the present study was therefore to investigate the extent to which results from randomized trials are valid in everyday clinical practice, i.e., to offer antibiotic therapy for acute appendicitis as the first-line therapy option to all patients with presumed acute appendicitis based on clinical evidence.

Materials and methods

This prospective nonrandomized population-based study was performed in the surgical clinics of Sahlgrenska University Hospital/Sahlgrenska and Sahlgrenska University Hospital/Ostra, the two main hospitals in Gothenburg, Sweden. The study population consisted of all consecutive adult patients (>16 years old) with acute appendicitis according to our established clinical practice, where radiological CT examinations and ultrasound are used only when the diagnosis appears uncertain [16, 17]. Thus, acute appendicitis was based on several variables, including anamnesis, abdominal status, laboratory tests, and radiological examinations, only in doubtful cases to reduce hospital costs and unnecessary radiation as recommended [18]. The size of the population served by Sahlgrenska University Hospital is around 575,000–600,000 individuals with an estimated incidence of appendicitis around 0.10–0.12 %, which is in line with various figures for Sweden during 2009 according to database information provided by a Swedish medical authority (Socialstyrelsen) as well as compared to estimates of our population before our previous and present studies. Also, our prestudy values indicated that around 18 % of patients with acute appendicitis in the Gothenburg area displayed perforation and around 82 % had nonperforated appendicitis at operation (see Table 6 in [9]). No patients from our population area were treated outside the present protocol as confirmed by follow-up investigations in all our available databases.

Interventions

Our recommendation was to offer antibiotic therapy as the first choice for treatment to all patients judged to have acute appendicitis. However, the surgeon in charge could decide to operate when deemed necessary based on objective and subjective clinical reasons or when the patient insisted on primary surgery according to our ethical permission. Failing antibiotic treatment, judged clinically as progression of abdominal status, increasing body temperature, and lack of overall improvement within 12–24 h, allowed subsequent appendectomy. Those who were pregnant or who had recurrent appendicitis following previous randomized treatment with antibiotics [9] were offered primary surgery. All patients on first-line antibiotics received intravenous antibiotics (piperacillin plus tazobactam 4 g every 8 h) for at least three doses usually within 24 h according to our previous experience [9]. During this time the patients were not allowed oral intake but received intravenous fluids. Patients with improved clinical status the next day (12–24 h) were discharged from the hospital with oral antibiotics (ciprofloxacin 500 mg and metronidazole 400 mg twice a day) for an additional 9 days [9]. Seventy surgeons performed all operations according to the emergency staff organization in our hospital.

Data collection and follow-up

Pre-, peri-, and post-treatment data were recorded according to protocol. The surgeons were always obliged to grade abdominal status at diagnosis and also state the reason for surgery when deemed necessary [9]. Questionnaires, including questions on remaining symptoms and abdominal pain, experienced additional hospitalization, and any kind of operation or relevant medical treatment, were sent to all patients after 6 and 12 months. Medical hospital data files for each patient were searched at a minimum of 1 year after treatment and complications, recurrences, and reoperations were registered.

Outcome measures

Primary endpoints were treatment efficacy and major complications. Efficient antibiotic treatment was defined as recovery without the need for surgery for the primary hospital stay and the 1-year follow-up should be without recurrence. Surgical treatment was regarded as efficient based on positive findings at exploration (appendicitis or other surgical diagnosis). Negative findings at exploration were regarded as surgical failure by protocol. Secondary endpoints were minor complications, duration of hospital stay and patient experience of abdominal pain or discomfort at follow-up.

Statistical analysis

The $\chi^2$ test was used to check for differences between proportions. Student's $t$ test was used for comparisons of
continuous variables between groups in order to apply high statistical power, although some variables may not be normally distributed without any bearing difference in this kind of large material as specifically confirmed by non-parametric statistics. $p < 0.05$ was considered significant in two-tailed tests. SPSS ver. 17.0 (SPSS, Inc., Chicago, IL, USA) was used for the statistical calculations.

The study was approved by the regional Committee of Ethics in Gothenburg, Sweden (367-08).

**Results**

Between May 2009 and February 2010 a total of 558 consecutive patients were hospitalized due to acute appendicitis and were all offered antibiotics as their first-line therapy according to our hospital clinical guidelines during this study period. Accordingly, 442 patients (79%) received antibiotics as the first-line therapy and 111 patients (20%) had surgery as their primary treatment (Fig. 1). The most common reasons for primary surgery were patient preference (56 patients, 50%) and a surgeon’s decision for indication of acute operation (35 patients, 32%). Five patients improved without any treatment but were still diagnosed as having acute appendicitis. Nine patients were either pregnant or assumed to have recurrence of appendicitis (Fig. 1).

**Patient characteristics**

Clinical, laboratory, and diagnostic variables at diagnosis of acute appendicitis before the start of any treatment are given in Table 1. Patients who received primary surgery had significantly higher white blood cell counts (WCC) and more local or general peritonitis. Patients who successfully recovered on antibiotics alone had significantly lower WCC, neutrophils, and temperature than patients who failed to improve with primary antibiotics. Radiological imaging was performed to a greater extent in patients with primary surgery (Table 1); CT investigations showed clear-cut or assumed appendicitis in 71% of patients on primary antibiotics and in 85% of patients on primary or rescue surgery as expected [19].

**Treatment efficacy**

Of the 442 patients who received antibiotics as the first-line therapy, 342 (77%) experienced successful recovery and 100 patients (23%) had subsequent rescue appendectomy (Table 2). The main reason for surgery subsequent to primary treatment with antibiotics was lack of improvement within 12–24 h (Table 3). Diagnoses in patients who experienced rescue surgery are given in Table 4. Among the 111 patients who had primary surgery, 98 (88%) had appendicitis or other surgically curable diagnoses. Thus, 12% were negative explorations. Ninety-two percent of extirpated appendices were sent for histopathology (PAD) (Table 4).

The proportions of phlegmonous, gangrenous, and perforated appendicitis did not differ between patients who had primary surgery and those who had rescue surgery (Table 4), and they agreed with frequencies reported for patient cohorts in Sweden. Thus, treatment efficacy of acute appendicitis appeared to be 77% for antibiotics as the first-line therapy (Table 2).

**Recurrences**

Of the 342 patients who initially recovered on antibiotics without surgery, 38 (11%) had experienced recurrent appendicitis at the 1-year follow-up (Table 2). Time to recurrence varied from 2 weeks up to the end of follow-up (12 months), with a mean time of 5 months. Relapsing patients were men and women between 17 and 89 years old; 33 of these patients were treated with appendectomy. The diagnoses at operation are given in Table 4. Six of these 38 patients had a second round of antibiotics treatment according to their own wishes; one of them did not recover and had appendectomy. The same diagnostic criteria were used for patients with recurrent abdominal pain as for patients at first admission for abdominal pain.

**Major complications**

Major complications within the 1-year follow-up did not differ significantly between patients who received primary antibiotics treatment and those who had primary surgery (Table 5). There was no difference in major complications between patients who recovered successfully on primary antibiotics and those who had subsequent rescue surgery following failed treatment with primary antibiotics. The five patients who recovered without treatment did not have any major complications and are therefore not included in Table 5. Appendicitis was confirmed by CT in two of these patients, while three patients did not have CT investigations.

Abscess formation was the most common complication following either primary antibiotics or primary surgery. In the antibiotics group, six patients were later operated on because of suspected appendicitis (diagnostic laparoscopy or open appendectomy) without any positive findings, i.e., it was an unnecessary operation by protocol. One patient was treated successfully with antibiotics but had recurrent problems with abdominal pain, abscess, and fistula and was finally diagnosed with Crohn’s disease and later had a ileocecal resection. One patient, treated with primary antibiotics, developed an abscess that required operative
drainage. One patient operated on due to recurrence suffered wound rupture and therefore had reoperation. Likewise, one patient operated on after failure with antibiotics developed a wound hernia and underwent reoperation with hernia mesh repair. Another patient operated on after failure with antibiotics came back a few days after discharge with acalculous cholecystitis, which was treated conservatively.

Reoperations were performed on two patients who had primary surgery: one for paralytic ileus and one for abscess formation. One patient with primary surgery had small bowel obstruction that resolved without surgery.
Table 1  Patient characteristics at time of decision for treatment of acute appendicitis

<table>
<thead>
<tr>
<th></th>
<th>Primary antibiotics (n = 447)</th>
<th>Primary surgery (n = 111)</th>
<th>p</th>
<th>Primary antibiotics (n = 342)</th>
<th>Antibiotic success (n = 100)</th>
<th>Antibiotic failure (n = 100)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M:F)</td>
<td>229:218</td>
<td>58:53</td>
<td>0.83</td>
<td>169:173</td>
<td>57:43</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>34 ± 1</td>
<td>35 ± 2</td>
<td>0.48</td>
<td>33 ± 1</td>
<td>36 ± 1</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>CRP (mg/l)</td>
<td>54 ± 3</td>
<td>68 ± 8</td>
<td>0.13</td>
<td>52 ± 3</td>
<td>64 ± 7</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>WCC (×109)</td>
<td>12.6 ± 0.2</td>
<td>13.6 ± 0.4</td>
<td>&lt;0.04</td>
<td>12.0 ± 0.2</td>
<td>14.7 ± 0.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Neutrophils</td>
<td>9.6 ± 0.2</td>
<td>10.2 ± 1.0</td>
<td>0.53</td>
<td>8.9 ± 0.3</td>
<td>12.4 ± 0.5</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>PCT (ng/ml)</td>
<td>0.85 ± 0.29</td>
<td>0.66 ± 0.28</td>
<td>0.86</td>
<td>0.76 ± 0.27</td>
<td>1.21 ± 0.91</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Temp (℃)</td>
<td>37.2 ± 0.03</td>
<td>37.3 ± 0.07</td>
<td>0.11</td>
<td>37.1 ± 0.03</td>
<td>37.4 ± 0.07</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Local peritonitis</td>
<td>99 (22)</td>
<td>38 (34)</td>
<td>&lt;0.01</td>
<td>73 (21)</td>
<td>26 (26)</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>General peritonitis</td>
<td>0</td>
<td>3 (3)</td>
<td>&lt;0.001</td>
<td>0</td>
<td>0</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>CT/US</td>
<td>165 (37)</td>
<td>60 (54)</td>
<td>&lt;0.001</td>
<td>120 (35)</td>
<td>43 (43)</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Gynecological examination</td>
<td>115 (53)</td>
<td>26 (49)</td>
<td>0.67</td>
<td>96 (55)</td>
<td>18 (42)</td>
<td>0.23</td>
<td></td>
</tr>
</tbody>
</table>

Values are mean ± SEM. Values within parentheses are percentages

PCT procalcitonin, CRP C-reactive protein, WCC white blood cell count, CT/US computerized tomography/ultrasound

* Primary antibiotics (n = 442) plus no treatment (n = 5)

Table 2  Treatment efficacy and recurrence beyond one-year follow-up

<table>
<thead>
<tr>
<th></th>
<th>Primary antibiotics (n = 442)</th>
<th>Primary surgery (n = 111)</th>
<th>No treatment (n = 5)</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment efficacy</td>
<td>342 (77)</td>
<td>98 (88)</td>
<td>5 (100)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Primary hospital stay</td>
<td>304 (69)</td>
<td>98 (88)</td>
<td>4 (80)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>1 year</td>
<td>38 (11)</td>
<td>-</td>
<td>1 (20)</td>
<td></td>
</tr>
</tbody>
</table>

Values within parentheses are percentage

* Comparison between antibiotics and surgery, χ² test

Table 3  Reasons for rescue surgery in patients provided primary treatment on antibiotics

<table>
<thead>
<tr>
<th></th>
<th>Antibiotic failure (n = 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic failure</td>
<td>68</td>
</tr>
<tr>
<td>Clinical deterioration</td>
<td></td>
</tr>
<tr>
<td>Clinical status unchanged</td>
<td>23</td>
</tr>
<tr>
<td>Patient wanted surgery</td>
<td>4</td>
</tr>
<tr>
<td>Diagnosis unclear</td>
<td>1</td>
</tr>
<tr>
<td>Severe pain</td>
<td>1</td>
</tr>
<tr>
<td>Reason unknown</td>
<td>3</td>
</tr>
</tbody>
</table>

Minor complications were twice as common among patients with primary surgery compared to patients treated with primary antibiotics (Table 6). Also, minor complications were three times higher in patients with antibiotics failure compared to those who successfully recovered on primary antibiotics. The most common complications among operated patients were prolonged postoperative course (vomiting, intestinal paralysis) and wound infection, and among antibiotics-treated patients, the most common complication was some side effect of the antibiotics (mainly diarrhea). The five patients who recovered without treatment did not experience complications.

Patient experience

The proportions of patients who experienced some kind of abdominal discomfort after 6 and 12 months did not differ between the antibiotics and the surgery group; after 12 months 27 % had some kind of abdominal symptom. The figures are based on questionnaire answers from 411 (74 %) patients at 6 months and from 382 (69 %) patients at 12 months. The proportion that answered the questionnaire was similar in both groups.

Duration of antibiotic therapy

Patients treated with first-line antibiotics had the same number of days of intravenous antibiotic therapy as patients who had primary surgery with subsequent perioperative antibiotics (1.6 ± 0.2 days). Patients who were operated on after primary antibiotics failure experienced prolonged antibiotic therapy (2.3 ± 0.1 days) compared to those who recovered on primary antibiotics alone, as
Table 4 Diagnosis in operated patients according to histopathology and perioperative diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Antibiotic failure (n = 100)</th>
<th>Primary surgery as deemed necessary (n = 35)</th>
<th>Primary surgery in total (n = 111)</th>
<th>Recurrences (n = 34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendicitis</td>
<td>97</td>
<td>34</td>
<td>97</td>
<td>34</td>
</tr>
<tr>
<td>Phlegmonous*</td>
<td>49</td>
<td>11</td>
<td>52</td>
<td>27</td>
</tr>
<tr>
<td>Gangrenousb</td>
<td>21</td>
<td>7</td>
<td>23</td>
<td>4</td>
</tr>
<tr>
<td>Perforatedc</td>
<td>27</td>
<td>16</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>Other diagnosis</td>
<td>3</td>
<td>1</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Nonspecific abdominal pain</td>
<td>3</td>
<td>1</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Surgically untreatable</td>
<td>1</td>
<td>4</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Surgically treatable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The frequencies of phlegmonous, gangrenous, and perforated appendices did not differ between initial antibiotic failure and primary surgery in total.

- Transmural inflammation including muscularis propria
- Transmural inflammation with areas of complete wall necrosis
- Transmural necrosis with histopathologic or intraoperative sign of perforation

Expected (p < 0.001). (The total number of days on antibiotics was not specifically measured in the present study, but it was 10 ± 0.3 vs. 4.6 ± 0.4 days in our previous randomized study [9]). Time from appearance in the emergency ward until start of intravenous antibiotic therapy was prolonged for patients who recovered on primary antibiotics (9.8 ± 0.4 h) compared to those who failed on primary antibiotics and had subsequent rescue surgery (6.0 ± 0.4 h; p < 0.001).

Table 5 Major complications beyond 1-year follow-up

<table>
<thead>
<tr>
<th>Reason for surgery</th>
<th>Primary antibiotics (n = 442)</th>
<th>Primary surgery (n = 111)</th>
<th>p</th>
<th>Primary antibiotics (n = 342)</th>
<th>Success (n = 342)</th>
<th>Failure (n = 100)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess</td>
<td>12</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Unnecessary surgery</td>
<td>6</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>4</td>
<td>2b</td>
<td>3b</td>
<td>1c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ileocecal resection</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fistula</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wound rupture</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wound hernia</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small bowel obstruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acalculous cholecystitis</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total no. of major complications</td>
<td>28 (6)</td>
<td>9 (8)</td>
<td>0.71</td>
<td>22 (6)</td>
<td>6 (5)</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>No. of patients</td>
<td>21 (5)</td>
<td>8 (7)</td>
<td>0.30</td>
<td>16 (5)</td>
<td>5 (5)</td>
<td>0.89</td>
<td></td>
</tr>
</tbody>
</table>

Values in parentheses are percentage

Reasons for surgery: * paralytic ileus, abscess; b Crohn's disease (ileocecal resection), wound rupture, abscess; c wound hernia (mesh repair)

Discussion

The results of the present study show that the modern treatment of acute appendicitis may be changing. Previous randomized controlled studies have indicated that a majority of patients with acute appendicitis will heal with antibiotic treatment without the need for surgery, although such studies have displayed various kinds of scientific limitations due to unavoidable ethical considerations in protocol design [8-10]. The most recent randomized controlled study was based on short-term surrogate markers for clinical outcome within 30 days of primary treatment. Its relevance for clinical outcome is therefore difficult to evaluate [11]. Besides, those patients were treated with a combination of amoxicillin and clavulanic acid, which are usually regarded less than ideal for gastrointestinal infections. Our previous study included unselected patients between 18 and 85 years of age to be treated by either antibiotics or conventional appendectomy following randomization [9]. The results agreed with those of other selected patient groups, where more than 75% of all patients with acute appendicitis recovered on antibiotics without the need of surgical exploration before discharge from the hospital [8, 10]. However, criticism has been

Hospital stay

Duration of the primary hospital stay was significantly shorter in patients who received primary antibiotics (2.3 ± 0.1 days) compared to the stay of those who had primary surgery (2.9 ± 0.3; p < 0.025). Patients who were operated on due to primary antibiotics failure had a significantly longer hospital stay (3.6 ± 0.2 days) compared to those who recovered on primary antibiotics alone (1.9 ± 0.1 days; p < 0.001).
Table 6 Minor complications beyond 1-year follow-up

<table>
<thead>
<tr>
<th></th>
<th>Primary antibiotics (n = 442)</th>
<th>Primary surgery (n = 111)</th>
<th>Success (n = 342)</th>
<th>Failure (n = 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>p</td>
<td>p</td>
<td>p</td>
</tr>
<tr>
<td>Prolonged postoperative course</td>
<td>14</td>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Wound infection</td>
<td>7</td>
<td>10</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>10</td>
<td>1</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Urticaria/rash</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Clostridium infection</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Postoperative abdominal infection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bladder dysfunction</td>
<td>2</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Small bowel injury</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fungal infection</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Thoracic pain</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Postoperative bleeding</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total no. of minor complications</td>
<td>42 (10)</td>
<td>26 (23)</td>
<td>&lt;0.001</td>
<td>20 (6)</td>
</tr>
<tr>
<td>No. of patients</td>
<td>40 (9)</td>
<td>22 (20)</td>
<td>&lt;0.001</td>
<td>20 (6)</td>
</tr>
</tbody>
</table>

Values in parentheses are percentage

a. Requiring urinary catheter at discharge
b. Oral and vaginal
c. Adverse effect of antibiotics
d. Related to pronounced postoperative pain

raised against our previous study design, since surgeons in charge or on call could decide to operate against the allocation by chance when randomized, despite final analyses by intention to treat [9]. A potential bias of our previous patient selection was, however, not possible to circumvent because of ethical considerations and permission [9]. Therefore, it could not be determined to what extent any selection bias in allocation of patients contributed to our otherwise clear results; which were highly debated among surgeons. This hesitation for a paradigm shift in treatment of acute appendicitis was characterized in a recent review and in a Cochrane Database Systems Review [3, 20].

In the light of previous uncertainties on biased patient selection, we decided to test the present research protocol. This means that a clinical decision was made to offer all consecutive patients hospitalized for acute appendicitis treatment with antibiotics as the first-line therapy in our university hospital. Again, ethical and medical considerations made it necessary to allow patients to accept or reject our offer. Also, it was necessary to allow the surgeons to make independent medical judgments in their offer for best treatment choice. This algorithm or principle should represent what may be a future application of optimized treatment of acute appendicitis. Therefore, our study represents the first full-scale practical test of the validity of previous randomized studies with daily practical limitations involved, i.e., many surgeons involved and no formally applied diagnostic procedure and criteria for all patients.

It may be regarded as a disadvantage that not all our patients had a CT or US examination, although imaging procedures are neither completely inclusive nor exclusive for diagnosis of early appendicitis, which should be the most preferred status to treat by antibiotics in a first-line algorithm. Therefore, acute appendicitis remains a diagnosis dependent on several criteria due to the lack of strict and highly specific criteria, even when systematic imaging is included. However, assumed appendicitis in the present study represents best available knowledge among university trainee surgeons. Accordingly, our observation that patients who recovered on primary antibiotics showed a higher degree of inconclusive CT findings ( ~29 vs. ~15%) should be expected in a protocol where antibiotics is offered before a definite choice for surgical exploration. The alternative, to compare the efficiency of antibiotics only in patients with clear-cut signs of appendicitis on CT, relates to a different clinical question than our present protocol with treatment of unselected patients with
clinically assumed appendicitis, including comparatively early appendix inflammation. Of course, this approach may imply some unnecessary antibiotics treatment due to bias inclusion of patients with nonspecific abdominal pain. However, this drawback should not be important when patients with increased CRP are treated, indicating a very high probability of any kind of abdominal bacterial infection or tissue damage where bacterial complications may be subsequent. In our present and previous studies, greater than 97% of all patients with acute appendicitis had elevated serum CRP [9], always indicating some kind of cellular infection/inflammation and usually not of viral origin.

Our present results agree with those of most randomized studies, i.e., a majority of patients will recover on antibiotics as the first-line therapy [8–10]. Thus, in the present study 77% of all patients with presumed acute appendicitis, based on overall clinical criteria, recovered initially, and 69% of all these patients remained without relapse after at least 1 year of follow-up. It is likely that the same success should be observed for those patients who chose primary appendectomy. It remains to be confirmed what the relapse will be after 5, 10, and 30 years of follow-up.

It is important to emphasize that major complications did not differ significantly between patients who received primary antibiotics and those who were recommended for or chose primary surgery. Also, there was no difference in major complications between patients who recovered successfully on primary antibiotics treatment and those who experienced subsequent rescue appendectomy. Interestingly, minor complications were twice as common among patients who had primary surgery compared to patients treated with primary antibiotics, and the proportion of patients who experienced some kind of abdominal discomfort between 6 and 12 months did not differ between the antibiotic and surgical groups. Surprisingly, almost 30% of all patients had some kind of abdominal symptom at the 12-month follow-up irrespective of their treatment schedule, which agrees with observations by others [10, 21]. Also, it is important to emphasize that patients treated with antibiotics as first-line therapy were not exposed to more intravenous antibiotics than patients who had appendectomy. This may be due to observations that clinicians do not always strictly adhere to intended prophylactic regimens following appendectomy. This fact attenuates arguments against different in-hospital initiation of antibiotic resistance among individuals treated with either antibiotics or appendectomy. Surgeons may be reluctant to accept this fact since it is usually proposed that postoperative treatment of appendectomized patients should have minimal or no perioperative antibiotics, although the significant role of antibiotics in the treatment of both operated on and conservatively treated patients appears quite clear [9, 12]. Anyway, it remains uncertain to what extent a 4–5-day difference in taking oral antibiotics is a real risk factor for increased development of antibiotic resistance in patients on successful primary antibiotics treatment outside of the hospital compared to patients who had surgery plus several days of perioperative in-hospital antibiotics [9].

Based on the results of the present study, we find it clear that physicians can offer evidence-based treatment with antibiotics as first-line therapy for acute appendicitis as long as our confirmed treatment protocol is offered and applied [9]. This means that all or at least most adult patients can be initially treated with antibiotics during a 12–36-h course when particular medical reasons do not argue for acute operation [22]. Such conditions may be generalized peritonitis, systemic sepsis, or any other sign of vital dysfunction [13]. Practically, this means that an emergency operation during at nighttime should not be necessary in the majority of patients with acute appendicitis [23]. Such a change in practice may also attenuate serious surgical complications, which are not negligible [9, 13, 24]. It is also clear that several important questions remain to be determined, such as the proportion of long-term relapse following primary antibiotic treatment, definite economical costs for treatment of acute appendicitis by antibiotics versus conventional surgery, which may be large as indicated in our previous report [9]; and to what extent relapse can be efficiently treated by second and third rounds of antibiotic regimens as suggested from observational data in the present study. It is also not clear how the combinations of antibiotics should be applied for optimal long-term results, since it has not been possible to predict antibiotic regimens based on bacterial cultures on inflamed and necrotic appendices [25, 26]. The clear discrepancy between our experience with antibiotics treatment of acute appendicitis and that of others [11] indicates that the choice of antibiotics makes a difference [9, 11]. Additionally, it will be very interesting to know how systematic oral provision of antibiotics compared to the present regimen of initial intravenous provision and subsequent oral treatment for 9 days.

In conclusion, the present prospective population-based study confirms results in previous randomized studies, that antibiotic treatment can be offered as the first-line therapy to a majority of patients with acute appendicitis without medical drawbacks other than the unknown risk for long-term relapse, which must be weighed against the unpredicted but well-known risk for both early and late serious complications following surgical interventions.
References

SESSION 2

Review Abstract Writing Exercise

The elements of style:
writing the abstract and constructing the manuscript

Introduction
Methods
Results (narrative, tables or graphs?)
Discussion (keep it short)
References

Exercise: Writing a manuscript review

Articles:
1. Benfield JR, Feak CB. How authors can cope with the burden of English as an international language. Chest 2006; 129; 1728-1730.
6. World Journal of Surgery Instructions for Authors
How Authors Can Cope With the Burden of English as an International Language*

John R. Benfield, MD, FCCP; and Christine B. Feak, MS

(CHEST 2006; 129:1728-1730)

Key words: English; language barrier; medical writing; writing

Abbreviations: EIL = English as an international language; TVR = tricuspid valve replacement; VSD = ventricular septal defect

BACKGROUND

English is the language of the most widely read and quoted medical journals. This poses a challenge for many authors whose native language is not English. Such authors struggle with the English language burden just as native English-speaking professionals are challenged by language barriers in countries where another language is spoken. Given these linguistic challenges, English as an international language (EIL) authors tend to believe that their manuscripts are significantly less likely to be accepted than manuscripts from native speakers. In reality, at least 50% of the publications in many of the best peer-reviewed journals are contributed by EIL authors. For example, from 2003 to 2005, the Journal of Thoracic and Cardiovascular Surgery received 59 to 63% of its manuscript submissions from EIL authors (P. Fried, MBA; personal communication; January 2006) and the experience of the Annals of Thoracic Surgery was essentially the same (H. Pusztay, BA; personal communication; January 2006). For both journals, the acceptance rates of EIL-authored manuscripts is essentially the same as that for native speakers.

EIL author manuscripts often do require more work from reviewers and editors than manuscripts from native speakers. For example, the EIL author manuscripts for which we studied the review process in detail required significantly more revisions to achieve clarity of expression compared to similar manuscripts from native speakers during the same period of time.

We believe that the privilege of being native English speakers comes with a responsibility to help EIL colleagues with their English. Accordingly, within the past 5 years we have conducted 15 interactive workshops for EIL cardiothoracic surgeons along with 3 similar sessions for other surgical specialties and for gastroenterologists in the United States and Japan.

All interactive sessions that we presented had curricula that were specific to the specialties we were addressing. The examples we used as the basis for exercises that the EIL participants completed were drawn from EIL manuscripts and from written comments from reviewers and editors. All curricula were jointly prepared by a peer (J.R.B.) and an English for academic purposes language professional (C.B.F.). Dr. Benfield was a clinically active faculty member for 36 years in academic surgery. He has served on eight editorial boards, including 15 years as associate editor of the Annals of Thoracic Surgery, and as editorial consultant to 11 publications, including CHEST and the New England Journal of Medicine. Ms. Feak teaches at the English Language Institute of the University of Michigan. She has coauthored two books about academic writing and is on the editorial board of the journal English for Specific Purposes. She has worked as an EIL teacher for 22 years and has served as consultant for the US Department of State. Both authors brought different strengths to the audience during the interactive sessions of instruction, as indicated by the written evaluations provided by the audience.

During preparation of learning exercises, the lan-
The reformulation written by the language professional clearly differs from the drafts of the surgeons, who began by focusing on the unacceptably high incidence of the complication when the conventional suturing method was used. The language professional instead proposed beginning with the information given in the second sentence about the conventional suturing method because she assumed this was common knowledge. Her proposed strategy was to delay the statement of the problem until later in the introduction. She employed the often-used strategy of starting with information already known to readers. In the next sentence, she suggested that the author explain why the conventional method had been used, but she had to resort to queries to the author (in italics) rather than to a more concrete suggestion because she lacked subject knowledge.

The language professional perhaps demonstrated better mastery than the peer of the use of language to achieve a particular rhetorical effect. The peer, however, followed the EIL author's draft more closely but was able to "read between the lines" of the original as a result of his subject matter knowledge. In the first sentence of his reformulation, he suggested replacing the author's term intricate modification with the term improvements. Furthermore, he suggested that the author's term surgical management (a generality) be replaced with the term suturing method (a term specific to the message of the article). The peer also omitted the term high with values ranging because he understood that this phrase was redundant in light of the numbers the EIL author quoted immediately thereafter. In the second sentence, the peer was also able to explain that the goal of the conventional suturing method was "to avoid the bundle of His in its left ventricular course."

Although peers and language professionals bring different skills and perspectives to the revision process, convergence is common. We found that when content seemed fine to both of us but the focus or emphasis were unclear, our independently suggested revisions usually coincided nicely. The following three versions from the first section of a conference abstract reveals that the peer and the language professional each made quite similar changes that greatly improved the EIL author's original abstract.

EIL Author Draft

Background: We reviewed the patients who underwent tricuspid valve replacement (TVR) to compare the long-term clinical results of bioprosthetic valve with mechanical valve in tricuspid position.
Language Professional Draft

Background: The choice of a bioprosthetic vs a mechanical valve in tricuspid valve replacement (TVR) continues to be debated. We reviewed the long-term clinical results of TVR involving these two valves.

Peer Revision Draft

Background: Tricuspid valve replacement (TVR) has been accomplished with mechanical and bioprosthetic valves. The relative long-term merits of the two types of valves are incompletely known.

In the above, the EIL authors simply stated the nature of their research, while the language professional and peer thought that the background could be strengthened by highlighting a need for the research. In the peer’s draft, this was accomplished by stating that the relative merits of the two valves were unknown, while the language professional went so far as to suggest that the choice of valve, rather than the merits of each, was a source of debate.

Expiication

Does the choice of the right words and phrases really matter? Winston Churchill and Mark Twain thought it did. According to Johnson, Twain proclaimed that “the difference between the almost right word and the right word is really a large matter—it’s the difference between the lightning bug and the lightning.” Also, in his famous speech of 1940, Churchill said “Let us therefore brace ourselves to our duties and so bear ourselves that if the British Empire and its Commonwealth last for a thousand years, men will still say, ‘This was their finest hour.’” Johnson states, “Try substituting another word for finest in the last sentence. ‘This was their best hour’? ‘Most noble hour’? ‘Most courageous hour’? Nothing else serves as well as finest. You can hear the lightning crackle.” In science, it is important for all authors to be able to express themselves fully. Good scientific publication demands accuracy, completeness, and the power of analysis and interpretation.

Take-Home Messages

In order for the revision process to move beyond the simple goal of “fixing” a text to a process in which EIL authors are developing their writing skills on the way toward becoming independent writers, input from both a language professional and an experienced peer is important. The language professional should ideally be a schooled and experienced applied linguist, and the peer a specialist in the subject matter of the manuscript. This ideal is difficult to achieve, in part because EIL authors may only have access to native English-speaking “amateurs.” Also, peers who are specialists in the discrete subject matter may be difficult to find. However, making the ideal available to a significant number of EIL authors is a realistic goal for the future. In the meantime, the following is our “take-home message.”

1. Contributions from EIL authors in English are welcomed and sought by the best peer-reviewed journals.
2. EIL authors should not compromise achieving full expression of their thoughts.
3. EIL authors should carefully evaluate the credentials and experience of any language professional they might retain. They must not assume that any well-educated native English speaker merits their trust and payment.
4. EIL authors should seek the assistance of a peer with good English-writing skills, if at all possible.
5. The review of EIL manuscripts by a qualified language professional should precede review by a qualified peer.
6. EIL authors are encouraged to create regular opportunities in their own communities to use English at least once a month.
7. The goal of creating an ideal budget-neutral authors editorial service for EIL authors is realistic if startup funding to work in that direction could be found.

We close with the recognition that our recommendations constitute a difficult challenge for most EIL authors, and with appreciation for the extra effort and hard work EIL authors expend to report good science. Those of us who have editorial experience and responsibilities take off our hats to you!

References

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A PERSONAL VIEW

HOW TO REVIEW A PAPER

Dale J. Benos, Kevin L. Kirk, and John E. Hall

1Department of Physiology and Biophysics, University of Alabama at Birmingham, Birmingham, Alabama 35294; and 2Department of Physiology and Biophysics, University of Mississippi Medical Center, Jackson, Mississippi 39216

Most scientists acquire their training in manuscript review not through instruction but by actually doing it. Formal training in manuscript analysis is rarely, if ever, provided. Editors usually choose reviewers because of expertise in a given subject area and availability. If an individual repeatedly submits bad reviews, it is likely that that person will not be asked to review a manuscript again. Being invited to review a manuscript is an honor, not only because you are being recognized for your eminence in a particular area of research but also because of the responsibility and service you provide to the journal and scientific community. The purpose of this article is to define how best to peer review an article. We will stipulate several principles of peer review and discuss some of the main elements of a good manuscript review, the basic responsibilities of a reviewer, and the rewards and responsibilities that accompany this process. Proper reviewer conduct is essential for making the peer review process valuable and the journal trustworthy.

ADV PHYSIOL EDUC 27: 47-52, 2003;
10.1152/advan.00057.2002

Key words: publications; ethics; peer review; reviewer responsibilities

Like any skill, the art of reviewing manuscripts is one that improves with practice. Although a person is not born with the knowledge or ability of how to be a good reviewer, the characteristics (e.g., fairness, thoroughness, integrity) of that person certainly contribute to the activity. Unfortunately, it is rare to find a scientist whose formal training has incorporated instruction in the art of reviewing. Nonetheless, the techniques of peer reviewing a manuscript can be nurtured and developed. Yet, peer review is a recognized and critical component of the overall publication process that confers “added value” to a submitted paper. Moreover, editors are dependent on the identification of a cadre of “good” reviewers that they can rely on for quality control and process efficiency. Reviewers, for the most part, act in this capacity from a sense of duty, selflessness, and a desire to contribute in an important way to the maintenance of high standards and veracity in their specific areas of research. Usually, no monetary compensation is, or should be, provided.

This article will serve as an introduction to peer review. Our intent is to identify issues and ethics of the review process, not to provide a comprehensive set of guidelines for all aspects of the review process. We will focus on the peer review of research manuscripts submitted to scientific journals, but many of the elements of peer review can be applied to other areas, such as grants and books. Several questions will be addressed. What constitutes a good review and reviewer? How should the review of a manuscript be approached? What elements of a review are most useful to the authors and editors? Should a manuscript be reviewed differently depending on the nature of the journal? It is our contention, based on experience,
that if a reviewer acts as an "author advocate," then many potential problems that may arise during the peer review process will be avoided. For example, a reviewer should treat a manuscript being reviewed as he/she would want his/her own paper treated, i.e., provide a critique that is positive, critical yet objective, and balanced, contains no personally offensive comments, and is returned promptly. When specific criticisms are made, the reviewer should indicate precisely what the problems are and how they may be overcome. A confusing or uninformative critique is not helpful either to the authors or to the editor. If the reviewer disputes a point made by the authors, he/she should provide explicit justification for his/her argument (e.g., literature citations). Unjustified biases on the part of the reviewer have no place in peer review. A reviewer also has a responsibility to familiarize him/herself with all aspects of the manuscript unless directed by the editor to focus on a specific area. This may entail reading previous, related articles from the authors or other papers in the field. It is fair to assume that the authors of the submitted manuscript are passionate about their work and that they have made a legitimate effort to perform and interpret their experiments carefully. However, the other hat that a reviewer must wear is that of the "journal advocate." As a journal advocate, the reviewer’s job is to make sure that the best possible science appears in print. The purpose of peer review is to ensure that mistakes in procedure or logic have been made; 2) that the results presented support the conclusion drawn; 3) that no errors in citations to previous work have been made; 4) that all human and animal protocols conducted follow proper review and approval by appropriate institutional review committees; and, very importantly, 5) that the work is original and significant.

ELEMENTS OF MANUSCRIPT REVIEW

Manuscript review can be divided into two main categories: the technical and the ethical. Both aspects are primarily concerned with making the manuscript better and ensuring that it is reporting trustworthy data. An example of reviewer instructions is presented as Table 1. Note that points 1, 2, 4, 5, and 6 are concerned with more technical issues. Is the writing clear, concise, and intelligible? Is the manuscript logical? Does it make a significant and novel contribution to the field? Are there any fatal methodological flaws? Are all the figures clear and necessary? Point 3 deals primarily with ethical issues. Are there any concerns with regard to the proper use and care of animals? If human studies were done, were they conducted with the prior approval of the subjects and institutions? Did the human protocols conform to prevailing ethical and legal standards? Point 7 likewise falls under an ethical realm, only not for the authors but for the reviewer. The manuscript must be treated in a confidential manner. Thus a reviewer must not only provide an unbiased evaluative analysis of the structural components of a manuscript but must do so in an acceptable, ethical context.

REVIEWER’S ETIQUETTE AND RESPONSIBILITIES

It is important to remember that a reviewer is asked to provide an informed opinion about a manuscript. The decision whether the manuscript will be published is made solely by the editor. Thus the editor must be able to discern very precisely the reviewer’s thoughts and weigh that opinion with or against those of the other reviewers and his/her own. An editor will appreciate a substantive evaluation of a manuscript. If a reviewer disagrees with the conclusion of an author, it is incumbent upon the reviewer to provide definitive reasons or appropriate citations, not simply make remarks such as, “I just don’t believe your data,” or “It can’t possibly be so.” If a reviewer has a bias against the author, he/she should recuse him/herself from reviewing the paper. A reviewer must be knowledgeable about the topic and have a clear understanding of the historical context in which the work was done. Because many manuscripts nowadays are collaborative efforts between different laboratories using a myriad of different techniques, it is unlikely that any single reviewer will be expert in all of the protocols encountered in a given paper. The reviewer should comment only on those aspects of the work with which he/she has familiarity; making the editor aware of this is helpful. Again, let us reiterate, the most important rule is to follow the golden rule: treat all manuscripts in the same manner that you would want your own treated.

The responsibilities of a reviewer can be summarized as follows.
### TABLE 1
Criteria for manuscript review

1. **Scientific quality of the work**
   - Are the methods appropriate and presented in sufficient detail to allow the results to be repeated?
   - Are the data adequate to support the conclusions?

2. **Presentations**
   - Writing: Is it clear, concise, and in good English?
   - Title: Is it specific and does it reflect the content of the manuscript?
   - Abstract: Is it brief and does it indicate the purpose of the work, what was done, what was found, and the significance?
   - Figures: Are they justified? Are they sharp, with lettering proportionate to the size of the figure? Are there legends to explain the figures?
   - Tables: Can they be simplified or condensed? Should any be omitted?
   - Trade names, abbreviations, symbols: Are these misused?

3. **Research violations**
   - Are there violations of the Guiding Principles in the Care and Use of Laboratory Animals?
   - If the research involved human subjects, were the studies performed in accordance with the Declaration of Helsinki?

4. **Rating**
   - Assign a rating on the reviewer form; rank the manuscript relative to other work in the same field.

5. **Confidential comments**
   - Provide comments regarding the novelty and significance of the manuscript.
   - Provide a recommendation about the manuscript’s suitability for publication in the journal; these comments will not be returned to the author(s).

6. **Comments for authors**
   - On the reviewer form, provide specific comments, preferably numbered, on the design, presentation of data, results, and discussion.
   - DO NOT include recommendations for publication on the second page.
   - Please be certain that your comments to the author(s) are consistent with your rating recommendation.

7. **Privileged document**
   - This manuscript is a privileged communication; the data and findings are the exclusive property of the author(s) and should not be disclosed to others who might use this information in their research.
   - The manuscript, illustrations, and tables should be destroyed upon completing the review or, if anticipating a revision, kept confidential until the review process is complete.
   - If you have shared responsibility for the review of this manuscript with a colleague, please provide that person’s name and institutional affiliation.

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1. The reviewer should provide an honest, critical assessment of the research. The reviewer’s job is to analyze the strengths and weaknesses of the research, provide suggestions for improvement, and clearly state what must be done to raise the level of enthusiasm for the work. The reviewer should not manipulate the process to force the authors to address issues interesting or important to the reviewer but peripheral to the objective(s) of the study.

2. The reviewer should maintain confidentiality about the existence and substance of the manuscript. It is not appropriate to share the manuscript or to discuss it in detail with others or even to reveal the existence of the submission before publication. There are some exceptions, if approved by the editor. One exception is that the reviewer may want a junior colleague to have the experience of reviewing and therefore may ask him/her to collaborate on a review. However, if this is done, your collaborator on the review should also agree to maintain confidentiality, and the editor should be informed of the participation of this additional person. Some journals require editor approval before a colleague or student is asked to view a submitted paper; others do not.

3. The reviewer must not participate in plagiarism. It is obviously a very serious transgression to take data or novel concepts from a paper to advance your own work before the manuscript is published.

4. The reviewer should always avoid, or disclose, any conflicts of interest. For example, the re-
viewer should decline to review a manuscript on a subject in which he/she is involved in a contentious dispute and does not feel that a fair review can be provided. The reviewer should also avoid biases that influence the scientific basis for a review. One example of this is a bias that favors studies with positive rather than negative results. Another example is if the reviewer has a close personal or professional relationship with one or more of the authors such that his/her objectivity would be compromised. Scientific merit should be the basis for all reviews.

5. The reviewer should accept manuscripts for review only in his/her areas of expertise. Although editors try very hard to match manuscripts with the most expert reviewers, sometimes mistakes are made. It is unfair to the authors and to the overall review process if the referee does not have the expertise to review the manuscript adequately. The exception to this general rule is when an editor specifically asks for your view as a “nonexpert” or seeks your opinion on a special aspect of the manuscript (e.g., statistics).

6. The reviewer should agree to review only those manuscripts that can be completed on time. Sometimes, unforeseen circumstances arise that preclude a reviewer from meeting a deadline, but in these instances the reviewer should immediately contact the editor. It is unfair to the authors of the manuscript for reviews to be inordinately delayed by tardy referees. Delaying a review can sometimes lead to charges by the authors that the reviewers are “stonewalling” in order to publish their related work first, thus establishing priority.

7. The reviewer also has the unpleasant responsibility of reporting suspected duplicate publication, fraud, plagiarism, or ethical concerns about the use of animals or humans in the research being reported.

8. The reviewer should write reviews in a collegial, constructive manner. This is especially helpful to new investigators. There is nothing more discouraging to a new investigator (or even to a more seasoned one) than to receive a sarcastic, destructive review. Editors are not trying to determine the scientific prowess or witiness of the reviewer. The reviewer should not shy away from discussing the weaknesses (or strengths) of a study, however. No one likes to have a paper rejected, but a carefully worded review with appropriate suggestions for revision can be very helpful. In fact, an author should prefer to have his/her paper rejected if the review process uncovered errors in the study.

SUMMARY

Reviewing is both a privilege and responsibility. It takes time to prepare a useful, critical review. Moreover, it clearly is a service to the journal, to the authors, to science at large, and to the reviewer because the reviewer becomes privy to the latest in cutting-edge research. Most journals do not pay referees, although most do provide acknowledgement in print to the editorial board and external referees in each issue of the journal and/or, like the American Physiological Society, by holding a yearly Publications Banquet at the Experimental Biology meeting. Peer review is the heart and soul of scientific publishing. Editors rely on reviewers to assess quality and to determine which of the many manuscripts competing for space will be published. Therefore, the most important reward for you as a reviewer is your contribution to the quality of published science.

We submit that, regardless of the perceived preeminence of any particular journal, you should approach the review of each research paper the same way. Table 2 provides a checklist for the essential elements that should be addressed in any review. Table 3 summarizes what a handling editor is concerned with when evaluating the quality of a review and reviewer.

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<th>Checklist for reviews: issues for comment</th>
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<td>1. Importance of research question</td>
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<td>2. Originality of work</td>
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<td>3. Delineation of strengths and weaknesses of methodology/experimental/statistical approach/interpretation of results</td>
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<td>4. Writing style and figure/table presentation</td>
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<td>5. Ethical concerns (animal/human)</td>
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From a practical point of view, publishing your own manuscripts depends on the quality and altruism of other peer reviewers, and you undoubtedly desire your own work to be evaluated carefully and fairly. There are many aspects of providing good constructive reviews. Some of these are best learned through your mentors and your own experience. However, the most important traits are courtesy, fairness, and punctuality. Thus, when peer reviewing, follow the golden rule: treat other manuscripts as you would want your own to be treated. The entire peer review process, which in essence determines the public record of science, is based on trust—trust between authors and editors and trust between editors and reviewers. The quality and integrity of the entire scientific publishing enterprise depends in large measure on the quality and integrity of the reviewers.

**RESOURCES**

Very little definitive research into the practice and effectiveness of peer review has been done, although groups such as the Council of Science Editors, the American Medical Association, the American Chemical Society, the American College of Emergency Physicians, and the Committee on Publication Ethics recognize the importance of such information. For example, the *Journal of the American Medical Association* has sponsored four International Congresses on Peer Review in Biomedical Publications (10). The September 2001 issue of *Academic Medicine* was dedicated to a discussion of review criteria and reviewer behavior for research manuscripts (5). A book summarizing the latest research on different aspects of peer review has been published by the *British Medical Journal* (4). A number of general articles on peer review and the role of a reviewer have been published (2, 6, 7, 9). Several articles concerning reviewer selection criteria and evaluation also exist (1, 3, 8).

**AUTHOR AFFILIATIONS**

Dale J. Benos, PhD, is a former Editor-in-Chief of the *American Journal of Physiology - Cell Physiology*, serves on five editorial boards of biomedical journals and has served on nine others in the past. He is currently Chair of the Publications Committee of the American Physiological Society and Chair of the Department of Physiology and Biophysics at the University of Alabama at Birmingham.

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Received 11 December 2002; accepted in final form 20 March 2003.

**REFERENCES**


2013 SSAT Presidential Address: Peer Review

Jeffrey B. Matthews

It has been my privilege this year to serve as president of the Society for Surgery of the Alimentary Tract (SSAT). I serve a second role in our society (together with Dr. Charles J. Yeo of Jefferson Medical College) as coeditor of our official journal, The Journal of Gastrointestinal Surgery (JoGS). Because the core function of a journal editor is the orchestration of peer review, I chose "peer review" as the topic of today’s address. I will provide some historical context for the relationship of editorial peer review to academic societies such as ours, uncover some of its warts, discuss how peer review might be improved, and how it may evolve in the rapidly changing world of digital information flow.

It is deeply engrained in us that peer review matters—evaluation by competent, professional experts is how we control the quality of the scientific information that makes it into print. Whether or not traditional peer review is the best way to control quality is open for debate. Peer review as a process has a number of well-documented flaws. Many question its continued relevance. There are those who think we should modify it; some say replace it, and some say do away with it altogether. In this sense, I am reminded of Winston Churchill’s 1947 remarks to the House of Commons, "Indeed, it has been said that democracy is the worst form of government except all those other forms that have been tried from time to time." Peer review might be the worst way to evaluate scientific work, but maybe it is still better than all the other ways.

Historical fun fact: the concept that manuscripts should be refereed prior to publication can be traced to a single person: Henry Oldenburg, who was the first Secretary of the Royal Society of London. In 1665, he became the founding editor of Philosophical Transactions, the world’s first scientific journal, and the oldest continually published. Oldenburg was well known in scientific circles throughout Europe and had an extensive network of contacts. It was he who invented the idea of sending manuscripts around to experts to judge their merit. 

By 1752, the Royal Society assumed oversight of Philosophical Transactions and established a "committee on papers"—a program committee of sorts—who were charged with reviewing articles submitted, thus formally cementing the relationship of a scientific society to its journal. Blinded peer review dates back to at least 1731. The Royal Society of Edinburgh, in its first issue of Medical Essays and Observations, described an editorial policy that sounds very modern:

"Memoirs sent by correspondence are distributed according to the subject matter to those members who are most versed in these matters. The report of their identity is not known to the author."

Thus, from the beginning, the practice of peer review was linked to the activities of academic societies who staked their reputation on the quality of papers published under their name. Some European societies required a majority vote of members prior to acceptance of a presentation. As early as the 1700s, societies published disclaimers of responsibility for what was contained within their journals. The first issue of the Annals of Surgery in 1885 included papers from the New York Surgical Society. Later that year, the Annals published the 1884 meeting of the American Surgical Association, which it has done ever since.

The Journal of Gastrointestinal Surgery was founded in 1997 out of the perceived need by our Board to increase visibility of the SSAT during a time where our priorities were to expand membership and extend the reach of the work conducted by SSAT members. The goal was to attract the very best manuscripts in GI surgery, starting with papers selected for plenary presentation at the annual meeting. Our program committee does the initial review of abstracts submitted to the
SSAT. They pick the best for oral presentation, and we require authors of plenary papers to submit full manuscripts to JoGS, a tradition straight out of the Royal Society of London 1665 whether we realize it or not. Of course, JoGS also publishes original articles outside of our meeting, along with reviews, case reports, How I Do It’s, and so on, submitted from authors around the world.

There are an estimated 300,000 scholarly publications, about 80,000 of which are peer-reviewed. About 10,000 are included in the Thomson Reuters Web of Knowledge, which is used to calculate Impact Factor and other metrics of journal quality. Impact Factor reflects the number of times an article published in a journal gets cited over a 2-year period, divided by the total number of articles that journal published during those 2 years. Here is the 10-year trend of the Impact Factor for JoGS (Fig. 1). For a young journal, we have made a lot of progress. Our most recent Impact Factor was 2.83, putting us 28th out of 74 GI journals and 33rd out of 198 surgical journals.

Let me give you a quick peek behind the curtain of peer review at JoGS (Fig. 2). Authors submit their work to our electronic Editorial Manager platform, and the manuscripts are then routed to the editors-in-chief by our managing editor. We make an initial assessment whether the manuscript is competitive for our journal. Like many journals, we receive far more manuscripts than we can consider and we return about 17% to the authors without formal review. For manuscripts making it past the initial screen, we select a minimum of two reviewers from our Editorial Board and a list of ad hoc experts. We are very thankful to our reviewers who all volunteer their time; some of them review dozens of papers a year for us. Like most mainstream journals, we use a single-blinded approach. The identity of the reviewers is kept secret from the authors, although the reviewers know the identity of the authors and their institution. Reviewers are asked to evaluate the manuscript on technical merits and novelty, the depth and quality of the presentation, the validity of the methods, the believability of the results, and the appropriateness of the conclusions. We also ask for a general impression of suitability for our journal and a recommendation to accept, revise, or reject. We take this input and, combined with our own reading of the manuscript, we reach an initial decision. It is rare that a manuscript gets accepted on first review. Over half are rejected outright. Some are given provisional acceptance after minor change. More often, we request a substantial revision and a point-by-point response to the issues raised. Ultimate acceptance is not guaranteed; the original reviewers look over the responses and consider the need for further revision. Articles that are accepted are published online and indexed within days, although it may be several months before they appear in print. Overall, our acceptance rate is around 26%.

This is how traditional peer review works at JoGS and most journals today. Reasonably fair, reasonably thorough, or may be not so much?

Even in the age of electronic publishing, peer review is still slow. It can take a year from submission to print. Some manuscripts are so sub-sub-specialized that it is hard to find a true expert who is willing to review. With all the competing demands on our time, reviewers are often late, sometimes to the point where we have to reassign the manuscript. Most reviewers submit thoughtful, thorough reviews; they make great points and good suggestions that truly improve the work. Other times, the comments are less constructive. Sometimes, reviewers do not agree—one recommends accept while the
other says reject. We may then ask for other opinions, although it is ultimately our responsibility as editors to adjudicate discrepant reviews. The process can really drag on if multiple revisions are necessary.

I would like to think that we usually get the decision right, but sometimes we do not. Reviewers and editors miss mistakes. It is inevitable that some manuscripts are going to find their way into print that are flawed, misleading, or incorrect to a degree. Harsh critics of the quality of the published literature such as John Ioannidis from Stanford estimate that as much as half of what is published is simply not true because of hidden methodological errors, false positives, faulty analysis, or overinterpretation of results. There is a general lack of confirmatory data and follow-up studies to validate many if not most research claims. And the literature quickly becomes obsolete and outdated.

Fraud is easily missed, particularly in the era of Photoshop where images can be doctored, cut and pasted with a mouse click. Although figure faking can be picked up by sophisticated software packages, most journals do not have the resources to make this routine. It is not just blots and pictures. We have encountered examples where whole clinical series were fabricated. Occasionally, a sharp reviewer raises questions of plagiarism, duplicate publication, or other misconduct, but we certainly do not catch it all. We now routinely run JoGS manuscripts through Crosscheck, an electronic screening platform that compares manuscript content to other published articles and flags similarities and identical phrasing.

When a bad paper gets published, peer review is at least partly to blame. On the flip side, good papers also get rejected sometimes, and that is also a failure of peer review. Reviewers and editors can wrongly reject a manuscript that proves later to have been correct, important, and occasionally groundbreaking.

If you have had your great manuscript rejected, you are in good company. Historically, there are many embarrassing examples where peer review simply blew it. The first was perhaps in 1796, when Philosophical Transactions turned down Edward Jenner's communication on smallpox vaccination. Hans Krebs' paper on the citric acid cycle—the Krebs cycle—a paper some consider the single most important in the field of biochemistry, was rejected. So, too, was the article on radioimmunoassay. Barbara McClintock's paper on mobile gene elements was rejected by Nature. Barry Marshall describes his difficulties getting his initial work with Helicobacter pylori and ulcers past peer review. The latter four examples each led to a Nobel Prize! So take heart when you get that rejection letter—you are not alone. These failures point out the challenge we face as editors and reviewers to recognize truly innovative work.

Reviewers and editors are human, and humans are never objective. Because we are individually biased, the published literature is collectively biased as a result. Subconsciously or not, we like "positive" or "hot" findings more than negative results. Authors know this, so they write their papers in a way that disproportionately highlights what is positive or what is new. This is a form of reporting bias. A consequence is time lag bias, where there is a substantial delay between the publication of positive studies and the appearance of negative or contradictory studies. The negative study almost never gets published first! Citation bias makes this worse: it is been shown that articles cite positive studies more often than negative studies. In fact, citations of studies that have long been disproven persist for years in the literature despite contradictory reports that get ignored.

And reviewers can skew the literature when they also judge more favorably those manuscripts that support entrenched opinion—especially ideas that align with their own work—rather than contrary points of view that go against established thought.

So, legitimate criticism can be levied against the peer review process. It is inefficient, it can get it wrong with what it accepts and with what it rejects, and it is biased.

Is there a better system? A number of ways to improve the practice of peer review have been proposed. But it is not clear if these make a meaningful difference. Unbinding reviewers, or having reviewers follow strict guidelines, or trying to mentor and train reviewers have been tried. At best, there is a very limited impact if you conceal the identity of authors from the reviewers or if you reveal the identity of the reviewers to the authors. Reviewer checklists have shown maybe a very small effect. You would think that the formal training of reviewers would improve the quality of their reviews and lead to better manuscripts, but there is insufficient data to confirm this. In fact, there is little evidence that standard peer review, or any of these modifications, does anything to improve the science contained within manuscripts, outside of their general readability, and how the data are presented.

However, this is not to say that there is nothing we can do to improve the peer review process. For example, compared to decades past, there are now more tools to help editors mitigate at least some of the weaknesses of our system. Take the problem of fraud. Journal editors now have common consensus standards for instances of suspected scientific misconduct. These standards developed through the initiative of a small group of journal editors from the UK who founded the Committee on Publication Ethics (COPE) in 1997. COPE now has over 6000 members including Springer journals like JoGS. COPE functions as a resource for editors, giving a framework to handle ethical issues such as duplicate publication, plagiarism, authorship disputes, and data fabrication in a uniform, transparent, and fair way.

Online, COPE has numerous flowcharts that take editors through a set of steps to investigate specific allegations. The flowchart for a case of suspected plagiarism, for example, covers the content and sequencing of communication to the author and to the author's institution depending upon the extent of the possible violation, and how to loop back to a reviewer.
who raised the question in the first place. COPE improves peer review by addressing ethical issues not only as they relate to fraud, but also to reviewer conduct. COPE recently posted guidelines for peer reviewers, a set of do's and don'ts to help ensure the integrity and fairness of the scholarly system.

These tools improve peer review and the performance of editors and reviewers working within traditional frameworks of traditional publishing of traditional journals. But perhaps peer review needs to transcend these traditions. Michael Eisen, an evolutionary biologist at Berkeley and a cofounder of the Public Library of Science wrote in a blog piece:

The system is not very good at what it purports to do... maintaining the integrity of the scientific literature by preventing the publication of flawed science; filtering of the mass of papers to identify those one should read; and providing a system for evaluating the contribution of individual scientists for hiring, funding, and promotion...it doesn't actually do any of these things effectively.

Eisen states he is not against peer review per se but feels that assessment and publication are two separate issues that should be completely dissociated. He argues that reviewers should first evaluate only the technical merits of the manuscript and if found to be sound the manuscript should be published, regardless of the perceived “importance” of the work. He proposes that after this— independent of their technical assessment and independent of the event of publication— reviewers should then comment on the significance of the work and indicate who might find it interesting: is it just for investigators in a very narrow field, or for a broader group of scientists and clinicians, or for the public at large? This subjective assessment might be published, with attribution, like a mini-editorial along with the article. Further online post-publication commentary by readers would be encouraged. This approach could theoretically speed the time from completion of the work to its online publication. And while it would not eliminate subjective reviewer bias, it would at least make the subjectivity transparent. Online pre- and post-publication peer review already occurs in a few disciplines such as the physical sciences but has yet to catch on in biomedicine.

The Public Library of Science, which Eisen helped to cofound in 2001, began as an advocacy group and later became an online publisher. Their stated mission is to transform research communication, and they and others have done much to modernize peer review and update scientific publication practices for a digital world. PLoS Biology was one of the first so-called Open Access journals in biomedicine.

Open Access refers to the immediate free availability of published papers to anyone, independent of subscription. Initially, there was much resistance to the idea of Open Access, out of a fear that it would put traditional publishing outlets out of business. Open Access can be construed as an “author-pays” approach to publishing, and there has long been a deep suspicion that if the price is right, peer review can be subverted and anything can get into print. It is hard to prove that the “quality” of articles published in Open Access journals is by definition lower than those published in traditional subscription journals. The quality of the PLoS family of journals is arguably better than most, and their approach to peer review is actually very rigorous. The Impact Factor of PLoS Biology is over 11. PLoS journals use an extensive checklist of manuscript guidelines including strict reporting criteria for human subject research, clinical trials, animal research, cell line research, and even for reviews and meta-analyses.

There is a lot to like about Open Access. It does increase the readership of scientific articles, and that has to be good. Research findings can more easily reach scientists and clinicians who may not have personal subscriptions or library access. And because Open Access immediately places scientific data and publications into the public domain, this information is available to anybody with a computer.

The spirit of the times— our Zeitgeist—is one that values transparency and public accountability. Open Access publishing clearly taps into the Zeitgeist. Advocacy for the principles of Open Access has caught the imagination of some of the more radical quasi-political elements in our culture such as the Occupy movement and WikiLeaks. Free access to data and the published literature was at the heart of the highly publicized Aaron Swartz case that led to his suicide in January. Aaron was a hacker who helped develop the syndication software used on Reddit and other sites. As he became more radicalized, he declared online what became known as the Guerilla Open Access Manifesto:

The world's entire scientific and cultural heritage, published over centuries in books and journals, is increasingly being digitized and locked up by a handful of private corporations. Want to read the papers featuring the most famous results of the sciences? You will need to send enormous amounts to publishers like Reed Elsevier. There are those struggling to change this. The Open Access Movement has fought valiantly to ensure that scientists do not sign their copyrights away but instead ensure their work is published on the Internet, under terms that allow anyone to access it.

Aaron's crime was to hack into MIT's library to open up access to the public. The Department of Justice went after him for a host of charges including computer fraud. In response to the outcry over the circumstances of his death, which was blamed in part on the fed's overzealous prosecution, the Obama White House responded in February with an executive order that federal research agencies develop formal plans to release scientific papers and data funded by government sources within a year of publication.
Open Access is here to stay. Having scientific data and the published literature for free rather than having to pay is what the people want. It has been argued that Open Access improves academic publishing by lowering overall cost while increasing the audience for science. Open Access journals use a different business model than traditional journals. Their model is not based on subscriptions or advertising. It is based instead on article processing charges that must be paid by the authors. Thus, the income to Open Access "publishers" is linearly and directly related to the number of articles they accept.

This model has been accused of having a so-called "dark side." There has been a rapid proliferation of Open Access journals with low quality standards, exploiting the author-pays model for profit, and flooding the internet with research articles of dubious value that have escaped the filter of peer review. Today, virtually every manuscript, no matter what the quality, can be published if the author has the money. Sometimes, gullible investigators are tricked by shady publishers that solicit manuscripts for dubious journals with impressive names, neglecting to mention the mandatory publication fees until after the copyright has been signed away.

What becomes of peer review in an Open Access world? Fortunately, Open Access and peer review are not mutually exclusive. Many traditional publishers, including ours, now have ways to accomplish Open Access within the framework of a subscription model. The critical point is that the opportunity to pay for Open Access follows the publication decision. For a fee, the author can maintain the copyright, and their published article can be made immediately available with no embargo period.

In time, everything will be Open Access. What it means to have something "published in a journal" is rapidly evolving. When pages do not matter, when there is not a true printed version, everything will eventually find itself online. How will all of this scientific information get organized so readers can properly interpret it? When the readership extends beyond the traditional biomedical professional audience, to include regulators, politicians, insurers, marketers, the media, patients, and the lay public? How will readers who are nonexperts determine which information is the most reliable, what is validated, what is most likely to be true and stay true? How will everybody swim through this flood of information and not drown?

Traditional peer review may no longer be the anchor it once was, but it remains the lifeline of scholarship. The late Dale Benos argued that stringent peer review is especially vital for clinical fields because of the risk to patients if unproven treatments escape proper scrutiny before appearing in the public domain. The counterbalance to misinformation may be to aggregate expert opinion in ways that give more context and perspective to the clinician or the patient. Second-line peer review may be particularly relevant in surgery, where randomized trials are difficult, and the use of devices and innovations in technique are not subject to the same regulatory oversight as drugs and other therapies.

In an Open Access world, traditional measures of journal performance may not tell the whole story. Of course, we are pleased that the Impact Factor of JoGS is rising, but scholarly citation is not the only way to measure our impact on the broader audience. Alternative metrics will include numbers of downloads, social media sharing, electronic links, and post-publication commentary.

We are continually looking for ways to evolve and improve The Journal of Gastrointestinal Surgery, and we welcome your input. We recently introduced a new article type called Evidence-based Current Surgical Practice. The idea came from David Adams and our Health Care Quality and Outcomes Committee who wanted to move away from publishing the usual stale watered-down practice guidelines. They suggested we solicit single-author papers that would be expert but individual interpretations of the latest evidence regarding best surgical practice. So far, these invited papers have lined up with our annual maintenance of certification course. But over time, these Current Surgical Practice articles may evolve into our own version of second-line post-publication peer review, appraising and synthesizing the most important new articles as they inform clinical decision making.

Together with our publishing team at Springer, we have held periodic retreats to discuss trends in the publishing industry and how we might better leverage JoGS to serve the priorities of the SSAT. We have discussed mobile App development, CME with self-assessment, and how to increase the global reach of JoGS. We believe that JoGS is an asset to the work of our committees, including the Maintenance of Certification, International Relations, and Continuing Education Committees. At Digestive Disease Week this year, we are introducing a lunchtime Writer's Workshop and Reviewer's Workshop.

Let me offer some final thoughts from the bully pulpit. Participation in peer review is our fundamental responsibility. It is an honor but also a duty to review manuscripts, abstracts, and grants. Say yes whenever possible, despite the many competing demands on your time. Remember how deeply the historical roots of peer review are embedded in academic societies, not just their journals. Tacit forms of peer review pervade our activities. You are the thought leaders; your opinions are important. You are always peer reviewing. Get up and ask a question, comment on a paper. Start a discussion with the authors standing by their posters at lunch. Intermingle with the many specialists here at DDW, not just the surgeons. Challenge and pressure-test claims for competing technologies and techniques, new drugs, and new algorithms for the care of the patient with GI disease. Join one of our committees, and, as a peer, weigh in on what is needed for continuing education, for maintenance of certification, and for measuring quality and outcomes for public reporting. Yes, peer review can be messy. But it has always
mattered and it matters still, perhaps more than ever. It has been at the core of what academic surgeons do for generations. And that should not change. It has been my great privilege and honor to serve as your President. Thank you.

References

15. Swartz A. Guerilla Open Access Manifesto http://cryptome.org/2013/01/swartz-open-access.htm accessed 03/14/13
INVITED ARTICLE

How to write a good scientific research paper and get it published

Kuberan Pushparajah • Shakeel Ahmed Qureshi

Introduction

Research is pivotal in advancing good practice and this is especially important in medicine. However, the true value of any research is only realised when the results are subjected to peer review and then published in journals. Apart from the obvious advances in the medical field, establishing a research profile, supported by peer-reviewed publications, will support professional and career development. A good publication profile will also be beneficial in supporting applications for funding in research. Therefore a structured approach is vital, and one must collect information accurately, analyse and interpret data critically and present the data objectively.

Preparation

“Every time I have prepared a battle, I’ve been forced to admit that the plan is useless......but planning is crucial”- Dwight D. Eisenhower

Writing a paper starts with good preparation. The pivotal point is identifying the question that is going to form the basis for the research. There are some crucial questions to consider before writing a paper (Table 1). The approach to this will be discussed in a systematic way.

What is the message of the research?

The perspective and knowledge of the existing data should be borne in mind. A thorough search of the published medical literature on the subject is essential. It is important to identify the key areas where your research data may add to the existing knowledge on the subject.

Choose the form of manuscript

There are several formats available for submission of the research material. These are usually clearly outlined by each journal in the instructions for authors and are briefly outlined below:

- Original article: These are in the form of completed research studies.
- Letter or short communication: These are usually quick and early communication of significant and original advance and are shorter than full articles.
- Review papers: These are a summary of recent developments in a particular subject area and are usually by invitation of the journal editors.
- Case reports: These are presentations of interesting cases which highlight a novel understanding of the basic mechanisms for a disease, highlight an abnormality or present a new role for diagnostic tools or treatment options.

What is the target journal?

When choosing a journal, it is important to review the journal brief to ensure your research paper is appropriate for the journal. This can be done by reviewing the potential journals via available online portals. The specific aims and objectives of the journals are usually stated clearly.

Authorship

An often-overlooked aspect to be considered at the start of the research is agreeing on authorship within the research
Table 1 Questions to address in planning research

1) What is the message?
2) Is it worth writing and spreading the message?
3) Has the work been presented or published previously by yourself or others?
4) Who is the target audience for the paper?
5) What is the format?
6) What is the target journal?

Table 2 Structure of the paper for submission

- Title
- Agreed authorship and the order of the authors
- Disclaimers, if any
- Abstract
- Keywords
- Main text (IMRaD): Introduction. Methods, Results, Discussion and Conclusions
- Acknowledgements
- References
- Supplementary material

Introduction

The background should be limited to no more than 3–4 short paragraphs and should define what is known and what is not known about the research question. Caution should be exercised not to bore the readers and the temptation to overload this section with an extended review should be avoided. The references used here should be targeted. The research question should be stated clearly in the last paragraph of the introduction and should underline why this question is important.

Methods

This section should include a description of the inclusion and exclusion criteria, the intervention and the outcome measures. References should be included for standard methods. The ethical issue and ethics permissions should be fully explained.

Results

This section should include the basic descriptive data, with text for the tables and evidence and figures for the highlights. It is always best to avoid overloading the text by using tables and figures, where appropriate. There should be a clear summary of the statistical methods used, and confidence intervals for continuous data should be included. Many authors tend to start a discussion in the Results sections, which may lead to rejection of the paper. Another common mistake involves differences in the results in the

Table 3 IMRaD format of paper writing

- Introduction—What is the question being asked and why?
- Materials and methods—How the question was investigated
- Results—What are the findings of the study?
- (and)
- Discussion—What do the findings mean?
Discussion

Repetition of the introduction section should be avoided. This is an opportunity to highlight and discuss the main points of the study. Therefore this section should include a statement of the principal findings of the research and a comparison with the existing knowledge in the subject. There should be a description of the interpretation of the study, with an explanation of possible mechanisms and implications for clinicians, supported by the scientific data. It is important to reflect on any unanswered questions and identify the areas for future research. Do not discuss results that were not presented in your data. It is vital not to overstate any conclusions that cannot be supported by the results. Any attempts to do this will result in rejection of the paper for publication in a peer-reviewed journal.

A clear description of the strengths and weaknesses of the study needs to be included and discussed in relation to other studies, especially in systematic reviews.

Conflict of interest

An author has a competing interest when he or she has an attribute that is invisible to the reader or the editor, but which may affect his or her judgment. This should be declared in the paper as it may have an effect on the judgment of the authors and may cause embarrassment, if it became known after publication of the paper.

References

References should be in the order that they appear in the text, and be consistent with the journal requirements, which are clearly stated in instructions for authors on the journal website. Always use the original reference, where possible and avoid using a second or third order reference.

Submission

A paper should be submitted to only one journal at a time. Attention should be paid to the journal requirements and the structure. English language usage should be checked and rechecked, with particular attention to the spelling and grammar. Many excellent papers are not accepted for publication, because of numerous errors of spelling, grammar and the usage of English language. Most journals have an online submission portal. Be sure to follow the instructions carefully and pay attention to the file formats required.

A checklist before submission is provided in (Table 4)

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Rejection

When submitting research papers, you should be able to deal with their rejection. There are several reasons for rejection from a peer reviewed journal. The main one includes a poorly written methods section, often being too brief. Other common deficiencies include “conclusions unsupported by data” [3] and “results unoriginal, predictable, or trivial”. The most common writing problem was “wordiness” [4]. Analysis of rejections in Indian Pediatrics [5] found similar deficiencies.

The submission may be beyond the scope of the journal. Often, the manuscript is rejected by the editorial office prior to peer review, due to the failure of the authors to format the paper according to the “Guidance for Authors”. It may also be rejected at this stage due to suggestion of inappropriate reviewers or having an inadequate standard of English. Manuscripts may be returned with suggestions from peer reviewers, however, they may still be rejected if there is an inadequate response by the authors to the reviewers’ comments or where there is a resubmission of rejected manuscripts without revision.

Dealing with rejection

The authors should prepare a detailed letter of response when dealing with a rejection from the journal. It is better to copy and paste the reviewers’ comments and address...
them individually, being careful not to not miss any points. You must specifically state any changes you have made to the manuscript and where possible, include the page and line number. You must provide a scientific response to the comments that you have accepted, or a polite rebuttal supported by good data, if you think that the reviewer is wrong. You must be aware that you cannot assume your manuscript will be accepted even after the revisions.

You should be prepared to revise your manuscript and submit to an alternative journal following feedback from the initial unsuccessful submission.

**Additional tips on writing**

Always use a good filing system on the computer to track versions of a manuscript. You can adopt new online file-sharing systems to facilitate multi-author contributions on a single document. It is essential to be careful to maintain patient confidentiality when using non-secure sites.

There are common pitfalls of writing including spelling, punctuation, structure, ambiguity, poor phrasing and length. The Flesch-Kincaid Grade Level can also be used to assess the grammar and level of understanding of the text. Microsoft Word will calculate this for you automatically. Word compiles the Average number of Syllables per Word (ASW) and Average Sentence Length (ASL) which it uses to calculate readability ratings. The formula used is \( \text{score} = 0.39 \times \text{ASL} + 11.8 \times \text{ASW} - 15.59 \). It is designed for US school level. So a score of 8.0 means that an eighth grader (about 13 year old level) can understand the document.

There are several useful online resources freely available that provide comprehensive guidance on manuscript preparation. These are summarized in (Table 5).

**Summary**

Research is very satisfying and publishing your findings in a peer-reviewed journal can be highly rewarding. Always think of what you want to say and who you want to say it to, whilst being sure your research methodology is robust and reproducible. There should be rigorous review of the manuscript content for correct spelling and grammar. You must be systematic in your manuscript preparation using a standard format as per the journal requirements and be prepared to revise your manuscript following reviewer comments. It is often worth asking a colleague not involved in the research to assess your manuscript before submission.

**References**

How to write a paper

Introduction

Writing is often viewed as a difficult task, and is frequently left to the last minute out of dislike, lack of confidence or lack of know-how. However, writing can be fun, and the fruits of your labour can have substantial benefits. The purpose of this mini review is to provide a template on how to write a manuscript for peer-review publication. By conveying to the reader in a succinct manner how to write a manuscript, writing will be viewed as a straightforward and pleasurable activity.

Instructions to authors

Before writing, it is imperative to obtain the ‘Instructions to Authors’. These instructions will detail the total character, word or page length for the manuscript, total number of figures and tables allowed, and total character or word count for the abstract. The precise format for the abstract will be provided, and typically includes a background, methods, results and conclusion sections. Many journals use different formats; thus, it is critical to obtain these instructions before starting to write. Another important aspect of the ‘Instructions to Authors’ is the actual typeset format used to prepare the manuscript document. While the majority of journals still require the document to be double spaced with specific margins (typically 1 inch) and specific sections, some journals have now adopted a single-spaced approach or even double-column single-spaced approach. Journals also have requirements regarding the use of abbreviations and references. Last, each journal has specific format requirements for figures. Many journals require the images to be JPEG or TIFF images, with specific requirements for image resolution if they are colour (i.e. 600 dpi) versus black and white (i.e. 300 dpi); however, some journals do allow images from PowerPoint files or as PDF images. Therefore, attention to these details will save time, energy and frustration on your part since submission using an incorrect format will either automatic rejection or annoyance on the part of the reviewers, with the later potentially leading to a less than favourable review.

Manuscript writing order

The key to writing a good manuscript is to tell a story! This is often best accomplished by writing the manuscript out of order from the journals prescribed order for the sections as certain sections are more logical and easy to write first, while others are easier to write after the bulk of the manuscript has been written. I recommend starting with the figures and tables, as the figures and tables should tell the whole story, as well as a good story (Fig. 1). After the figures and tables are determined, create the title page, carefully including all of the information required by the journal. Be sure to include all middle initials of authors if they are used by the authors, as well as correct institution information. After the title page, the methods (or materials and methods) section should be written, as this is simple to do and a logical lead into the results section. Next, complete the results section and organize this section using subheadings. This should be simple to write with the figures and tables in hand. While on your mind, after preparing the results section, it is convenient to write the figure legends. The introduction, followed by discussion should be written next. After you have all these data committed to paper (or rather, electronically), the introduction and discussion sections are less daunting to write. After all of the above sections are completed, it is time to write the abstract. A common mistake is to write the abstract first, before the results section. However, you will have a better sense of what to include in the abstract, as well as what to emphasize, after the majority of the paper is written. Remember, the abstract should include all pertinent data from the manuscript and accurately portray what is in the manuscript. Finally, do not forget the acknowledgements and references sections.

Figures and tables

The figures and tables of a manuscript should tell a story. They should be clear to the reader without having to read or refer to the text of the manuscript. Figures should be necessary and relevant. Unusual aspects of figures or aspects of the data that need emphasis should be labelled with arrows or other indicators, drawing the
readers' attention to these findings. Be careful and selective when including figures with negative data. While this can be very important to the overall message of certain manuscripts, more often than not, negative data are not sufficiently relevant to warrant a figure. Figures are used to emphasize data, and also to convey these data efficiently to the reader. Tables are typically used to convey larger sets of data for multiple different treatment groups, allowing the reader to make comparisons between groups. Tables are also helpful when providing background information and experimental or clinical data, especially numerical data. A common mistake made by authors is to include data in a table or figure and also describe it in the text. This type of redundancy is unnecessary and will usually be detected by careful reviewers and editors. Not only is it annoying to the reader, but it takes up valuable print space in the journal, and that costs money. Therefore, it is best to limit your tables and figures to relevant data and avoid redundancy.

Methods

The methods section conveys to the reader what experiments or interventions were performed to address the hypothesis or question that was formed for the study. Methods should be described in enough detail so that the reader can judge whether the findings reported in the results section are reliable. Additionally, enough detail should be provided to allow the reader to reproduce the experiment. If the methods have been described in a previous publication, it is acceptable and advised to reference that publication and only briefly describe the method. However, if deviations from the published methodology occurred, this should be clearly stated and described. If a new methodology is described, be sure to explain what experiments were conducted to test or validate the new methodology. The methods section should be subdivided into descriptive subheadings based on logical topics.

Results

The results section should tell a story and emphasize the take-home message. The results section should state the findings of the experiment and not contain conjecture. The latter is best left for the discussion section. Avoid repeating introductory material and minimize experimental details since experimental details belong in the methods section. Avoid lengthy analyses and comparisons to other studies, as those also belong in the discussion section. Furthermore, remember the difference between data and results. Data are the facts obtained from the experiments and observations, results are statements that interpret the data.

Arrange the results section in a logical fashion, either chronologically, most-to-least important, in vitro to in vivo, etc., using descriptive subheadings. For each subheading section, I find it helpful to state the purpose of the experiment(s) being performed to guide the reader seamlessly through these sections. After stating the purpose, the data are provided in a clear, concise and logical manner. At the end of each subheading section, a statement is provided that summarizes and interprets the data, that is, provides the results (e.g., "These data suggest that..."), This technique is a very effective and efficient approach to convey data and results to readers. The results section should also clearly direct the reader to the related figures and tables that support the data. Be sure to indicate "(Figure 3)" or "(see Table VI)." In addition, it is important to avoid overlap between the text in the results section and the figures and tables. If data are described in a table or figure, there is no need to also list those data points in the text, as this is redundant. In summary, well-laid out and well-written results section should be simple to read and should provide a clear story of the data for the reader to interpret and make independent assessments and judgments.

Figure legends

After writing the results section, it is simple to prepare the figure legends, as these two sections are very similar. Use brief sentences to describe the figure. Different journals have unique requirements regarding the format. For example, some journals prefer including a title sentence for each figure legend that is description, while others do not. It is prudent to review publications from that journal to determine how figure legends are formatted. Figure legends should be free-standing from the text of the manuscript, meaning that a reader should be able to fully understand the experiment and data provided in the figure by reading just the figure legend, and not having to refer to the text of the manuscript. Describe all aspects of the figure, and if the figure has multiple panels, each panel must be described separately. Minimize experimental details, as that is the purpose of the methods section. All abbreviations, lines, bars, arrows and symbols must be described. Provide statistical information; if the figure contains statistical notations such as asterisks, the P-values for these statistical notations should be provided in the figure legend.

Introduction

Grab the readers' attention with the introduction. Awaken the readers' interest and prepare them to understand the manuscript as well as its context to the scientific area being studied. Limit the introduction sections to no more than three paragraphs. In the first paragraph, clearly state the clinical problem being addressed and its significance within the medical community. In the second paragraph, state what is known and then what is not known about the clinical problem. In the third paragraph, relate what is not known about the clinical problem to your study, providing clear support for why your study is important and being conducted. Then, clearly state the goals or aims of the study, along with the hypothesis. If the introduction is too long or confusing, the reader will lose interest and not read the rest of the manuscript.

Discussion

Many authors fear writing manuscripts because of the discussion section. However, if the discussion section is deconstructed to just five paragraphs, it can actually be fun to write. In the first paragraph, summarize the results section and answer the question or hypothesis stated in the introduction. Place the data in the context of the bigger clinical problem. Examples of sentences that signal the answer include: 'This study indicates that...', or 'The results of this study..."
Abstract

The best time to write the abstract is after the manuscript is completed. The length of the abstract will be clearly stated by the journal and it is prudent to adhere to the length requirements. Sentence writing should be concise and succinct in the abstract, given the length requirements. Additionally, be careful to adhere to the formatting guidelines, as each journal has unique subheadings that must be used. In general, the abstract should provide an overview of the paper that makes sense when read alone and when read with the paper. The abstract should provide enough information for the casual reader to understand what the manuscript is about. Include information from each section of the manuscript in the abstract, being careful to include, highlight or emphasize important data and take-home messages, as often the abstract is the only part of the manuscript that is read. The abstract should not contain information that is not included in the manuscript. However, there may be some data in the manuscript that is not necessary to include in the abstract if it is not germane to the overall conclusion of the paper.

Acknowledgements

The beauty of the acknowledgements section is its simplicity and importance. This is where most journals require the listing of support from funding agencies. Also, acknowledge individuals that contributed to the work but did not meet criteria for authorship. Gifts of special reagents, animals, software, etc., can be described here. Administrative support can be acknowledged. Of note, many journals now require that authorization be obtained from all individuals named in the acknowledgements section, so be sure to read the ‘Instructions to Authors’ on this matter. Last, some journals ask for conflict of interest information or additional disclosure information in this section, or specifically have separate sections addressing these topics.

Conclusion

In summary, writing a manuscript can be fun when it is deconstructed into simple parts. By following this simple template on how to write a manuscript, writing should be simple and enjoyable. In particular, limiting the introduction to three paragraphs and the discussion to five paragraphs makes writing a manuscript a less daunting task.

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doi: 10.1111/ans.12036
World Journal of Surgery (WJS) publishes original articles that offer significant contributions to knowledge in the broad fields of clinical surgery, innovative developments in surgery, global surgical practice and economics, surgical education, rural surgery and surgical history. WJS welcomes predominantly human research, including clinical research, outcomes, and health service research. Laboratory research will be published only if it is highly significant and with clear and immediate translational potential to surgical care. WJS has an international circulation and is designed to serve as a medium for rapid dissemination of new and important information about the science and art of surgery throughout the world. In the interests of a wide international readership, use of the English language is required. Articles that are accepted for publication are done so with the understanding that they, or their substantive contents, have not been and will not be submitted to any other publication.

Types of Manuscripts

Please note: World Journal of Surgery does not accept Case Reports and Book Reviews for review or publication. WJS will consider publication without prior invitation the following types of manuscripts:

Original Scientific Reports: Original Scientific Reports are full-length reports of original basic or clinical investigations. Original Scientific Reports must adhere to a 2,500 word limit (not including the title page, abstract, references, tables, and figures). The final word count should be included in the title page of the manuscript. All clinical trials must be registered through a public trials registry that is acceptable to the International Committee of Medical Journals Editors (ICMJE). For information on ICMJE's statement to register clinical trials, please go to http://www.icmje.org/publishing10register.html. The trial registration number and agency should be listed on the title page and at the end of the abstract. Randomized clinical trials should be reported following the CONSORT criteria and provide a completed checklist and flow diagram upon manuscript submission. For information on CONSORT and to download the CONSORT checklist and flow diagram, please go to http://www.consort-statement.org/.

Systematic Reviews and Meta-analysis: Systematic reviews and meta-analysis of the literature are of interest to the journal, and will be handled with the standard peer review process. These reviews should not exceed 3,500 words, should have less than 75 references, and should contain no more than 5 figures or tables. Additional tables and figures can be submitted as supplementary information. Guidelines and a checklist for composing systematic reviews and meta-analysis can be found at: http://www.prisma-statement.org/. Please do not submit such reviews without consulting these guidelines and completing the PRISMA checklist.

Innovative Techniques in Surgery around the World: The WJS is interested in publishing high quality descriptions of innovative surgical techniques that have the potential to improve the quality or efficiency of care. While techniques with universal appeal are most sought after, novel techniques that allow broader access to care in resource challenged environments are also desirable. The successful manuscript will contain a detailed description of the technique and be richly illustrated with figures, and/or video. Line drawings are much superior to intraoperative photos, generally. A brief description of the authors experience with the technique should also be included, if possible. Qualifying manuscripts should be less than 1250 words, have no more than 3 authors, have no more than 5 references, and no more than 8 figures/video segments. A brief unstructured abstract is also required. Please see our instructions for submitting streaming video, below.

Papers Presented at ISW Congress: Includes manuscripts presented at an International Surgical Week (ISW) World Congress or at an Integrated Society meeting.
Multimedia Scientific Reports: WJS seeks manuscripts that contain brief video clips of surgical techniques or operative findings. Please see the "MULTIMEDIA MANUSCRIPT SUBMISSION" below for submitting video augmented manuscripts.

Surgery in Low and Middle Income Countries: WJS seeks high quality manuscripts describing the unique problems and unique solutions facing surgeons in rural and impoverished settings, globally. WJS requires that manuscripts that use primary data from a low- or middle-income country should include one or more local co-authors. A local co-author is defined as a national of that country who is living and working in their home country. All other author requirements need to be met for the author(s) from the low and middle income country. The editors understand that there may be extenuating circumstances in which this requirement cannot be met. In such cases, a cover letter should explain why a local co-author is not included. Further details on this editorial policy can be found at: World J Surg (2011) 35:2367-2368.

Cost-effectiveness research is especially valuable for the field of global surgery. However, unless the methods are sound, findings can sometimes be erroneous. WJS calls upon authors who undertake cost-effectiveness research in global surgery to review the methodologic points brought out by the following article when they develop, conduct, and write up their studies: World J Surg. 2017 Jan 19. DOI: 10.1007/s00268-017-3875-0 PMID: 28105528. WJS also requires completion of the checklist contained in the above article at the time of submission of cost-effectiveness studies. The checklist is available at: https://scholar.harvard.edu/shrime/cost-effectiveness-analysis-checklist. If the authors feel another checklist is more suitable for their particular study, they may use that checklist. In all cases of cost-effectiveness studies, the checklist used should be stated in the cover letter and the completed checklist attached to the cover letter.

Letter to the Editor: Letters should pertain to material previously published in WJS. Letters should not exceed 500 words with no more than five references, the first of which should be the article on which you wish to comment.

WJS will also consider for publication the following types of manuscripts by invitation only:

- Editorial Perspective and Commentary
- Surgical History

MANUSCRIPT SUBMISSION GUIDELINES AND REQUIREMENTS

All manuscripts must be submitted online to WJS via the ScholarOne Manuscripts website (formerly Manuscript Central). Please login directly onto the site at http://mc.manuscriptcentral.com/WJS and upload your manuscripts following the instructions given on the screen. Authors should keep copies of all manuscript files. WJS accepts no responsibility for files that are lost or destroyed due to electronic problems. Upon manuscript submission, the Editorial Office will review all manuscript files to verify that guidelines and policies stated in this document are adhered to. Your manuscript will be unsubmitted if it does not meet the proper submission requirements.

Authors entering the ScholarOne Manuscripts website can either create a new account or use an existing one. If you have an existing account, please use it for all your submissions and you can track their status on the same page. If you are unsure about whether or not you have an account, or have forgotten your password, enter your email address into the "Password Help" section. You will then receive an automatic e-mail with a new password which you will be prompted to change after logging in. Otherwise please create a new account and then follow the instructions given on the screen. Once you have logged into your account, ScholarOne Manuscripts will lead you through the submission process in a step-by-step orderly process. If you cannot finish your submission in one visit, you can save a draft and re-enter the process at the same point for that manuscript. At any point during this process, there are Help buttons available to see common questions and a support link to ask a specific question via email. After submission, you may return periodically and monitor the progress of your submission through the review process. Authors should go to https://mc.manuscriptcentral.com/wjs and click on "System Requirements" for the most updated list of system and browser requirements that should be used with ScholarOne Manuscripts.
Upon manuscript submission in the ScholarOne Manuscripts website, authors will be required to enter the following information:

- Selection of the appropriate manuscript type
- Full title of the manuscript
- Structured abstract (up to 250 words)
- Selection of the appropriate keywords associated with the manuscript
- Names and details of all contributing authors [i.e., e-mail, first name, middle initial(s), surname, degree(s); the departmental and institutional affiliation(s); complete street or mailing address for each affiliation, including the city, state or province, and country where the work was performed].
- Copyright Transfer Statement signed and dated by the corresponding author on behalf of all authors must be uploaded with each manuscript submission. To download the form, please go to www.springer.com/00268 and click on “Copyright Transfer Statement”.

If you are unable to submit your manuscript via the ScholarOne Manuscripts website or have any questions about WJS, please contact the editorial office:

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MANUSCRIPT PREPARATION AND ORGANIZATION

General instructions:

- Use a normal, plain font (e.g., 10-12 point Times Roman or Arial) for text
- Double-space the text
- Use italics for emphasis
- Use the automatic page numbering function to number the pages
- Do not use field functions
- Use tab stops or other commands for indents, not the space bar
- Use the table function, not spreadsheets, to make tables

Manuscript style and text formatting: Styling and text formatting refers to the use of special effects to enhance the appearance of the published article. Please make note of the following "Dos and Don'ts" regarding styling:

- DO enter all lists as single column lists.
- DO use your word processing features to indicate bold, italic, superscript, and subscript text within a paragraph or heading.
- DO NOT center text for headings. All text should be justified left, with ragged (unjustified) right margins.
- DO NOT use italic, underline, or other type effects for the entire text of a heading.
- DO NOT use all capital letters for a heading; use initial caps instead.
- DO NOT use multiple spaces to set up columns or tables; use tabs instead.
- DO NOT use carriage returns at the end of each line of text (use the word wrap feature).

Manuscript organization: Manuscripts should be organized and follow the sequence as indicated below:
TITLE PAGE: The title page should include:
- A concise and informative title
- The name(s) of the author(s) including the affiliation(s) and address(es) of each author. The complete name and address of the author to whom correspondence should be sent, as well as his/her phone number, fax number, and email address.
- A short title for use as a running head.
- Keywords: 2-3 keywords relevant to the manuscript
- Trial registration number for randomized clinical trials (see "Types of Manuscripts: Original Scientific Reports" above)
- Grant support for the research reported
- Potential and real conflicts of interest
- Manuscript word count

ABSTRACT (if applicable): The abstract must appear between the title page and the Introduction section of the manuscript, even if it has been uploaded separately. Manuscripts should contain a structured abstract of not more than 250 words. It should be a factual description of the study performed organized with the headings of Background (includes aims, hypotheses, or objectives), Methods (includes patient population, procedures, and data analysis), Results, and Conclusions. The abstract should contain the data to support the key findings or conclusions of the study. The trial registration number for randomized clinical trials must be included at the end of the abstract. The first time an abbreviated term is used, spell it out in full and follow with the abbreviation in parentheses – for example: ultrasound (US).

TEXT: Original Scientific Reports should be arranged in sections titled Introduction, Material and Methods, Results, and Discussion.

1. Introduction: conveys the background and purpose of the report
2. Material and Methods
3. Results & Discussion

When required by the nature of the report, manuscripts that do not follow this specific format may be accepted.

ACKNOWLEDGEMENTS: A brief statement should acknowledge individuals, other than authors, who were of direct help in the reported work or if the work was supported by a federal or commercial grant. All acknowledged persons should give their written consent to being named in the manuscript. This consent is to be uploaded upon manuscript submission.

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In references to journal articles, please include (1) surname and initials (without periods) of the first three authors and et al for all others, (2) the year in parentheses, (3) title of article, (4) abbreviated Journal name, (5) volume number, and (6) inclusive page numbers, in that order. An example follows:


In references to books, please include (1) surname and initials (without periods) of the first three authors and et al. for all others, (2) chapter title, if any, (2) chapter title, if any, (3) the year in parentheses, (4) editor(s), if any, (5)
title of book, (6) publisher, (6) city of publication, and (7) inclusive page numbers. Volume and edition numbers, and name of translator should be included when appropriate. Examples follow:


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- All tables are to be numbered using Arabic numerals
- Tables should always be cited in text in consecutive numerical order
- For each table, please supply a table heading
- The table title should explain clearly and concisely the components of the table
- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body

ARTWORK:
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- Supply all figures electronically
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- All figures are to be numbered using Arabic numerals
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- A Multimedia manuscript is an article with imbedded video material. Up to 3 videos per manuscript submission will be accepted. All standard instructions for Audio, Video, and Animations should be followed for Multimedia Manuscript Submissions.
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Generic names for drugs and chemicals should be used the first time the drug or chemical is mentioned in the text and, preferably, thereafter. The first reference to a drug or chemical in the text should be followed by the manufacturer name, city, state or province, and country – and, if you wish, the trade name – in parentheses.

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CONSENSUS STATEMENT ON SUBMISSION AND PUBLICATION OF MANUSCRIPTS
(Published in the June 2001 issue of World Journal of Surgery, page A7)
Increasing problems of duplicate and fraudulent submissions and publications have prompted the editors of surgical journals, including World Journal of Surgery, to support these overall principles of publication:

Duplicate Submission and Publication
In general, if a manuscript has been peer-reviewed and published, any subsequent publication is duplication. Exceptions to this general rule may be:

a) Prior publication in meeting program abstract booklets or expanded abstracts such as those published by the Surgical Forum of the American College of Surgeons or Transplantation Proceedings. However, these must be referenced in the final manuscript.

b) A manuscript which extends an original database (a good rule might be expansion by 50% or more) or which analyzes the original database in a different way in order to prove or disprove a different hypothesis. Previous manuscripts reporting the original database must, however, be referenced.

c) Manuscripts which have been published originally in non-English language journals, provided that the prior publication is clearly indicated on the English language submission and referenced in the manuscript. In some circumstances, permission to publish may need to be obtained from the non-English language journal.

For example, any submission duplicating material previously published in full in "Proceedings" or book chapters is considered duplicate unless the exceptions in (a) above apply. Similarly, manuscripts dealing with subgroups of data (i.e., patients) that have previously been analyzed, discussed and published as a larger group are considered duplicate unless (b) above applies.

The Internet raises special concerns. If data have previously appeared on the Internet, submission of those data for publication is considered duplication. If Internet publication follows journal publication, the journal publication should be clearly referenced. Some journals may provide early Internet publication of accepted peer reviewed papers which are subsequently published in that journal. This does not constitute duplication if both manuscripts are identical and covered by the same single copyright.
Fraudulent Publication
The following activities are examples of fraudulent publication practices:

a) Willful and knowing submissions of false data for publication.
b) Submission of data from sources not the author's (or authors') own.
c) Falsely certifying that the submitted work is original and has not been submitted to, or accepted by, another journal.
d) Sponsoring or vouching for a manuscript containing data over which the sponsor has no control or knowledge.
e) Allowing one's name to appear as an author without having contributed significantly to the study.
f) Adding an author's name to a manuscript to which he/she has not contributed, or reviewed or agreed to in its current form.
g) Flagrant omission of reference to the work of other investigators which established their priority.
h) Falsification of any item on the copyright form.
i) Failure to disclose potential conflict of interest with a sponsoring agency.

While not intended as an all-inclusive document, these examples and guidelines should alert authors to potential problems that should be avoided when they are considering submission of a manuscript to a peer-reviewed journal.

Surgery Journal Editors Group Consensus Statement on the Adoption of the COPE Guidelines
We, the undersigned member journals of the Surgery Journal Editors Group (SJEG), in the furtherance of integrity in surgical and scientific publication, agree to adopt the guidelines established by the Committee on Publication Ethics (COPE)\(^1\). The COPE guidelines represent a means of addressing a variety of ethical concerns, including duplicate publication and authorship misconduct issues, which have, unfortunately, become more prevalent.

\(^1\)COPE Committee on Publication Ethics. http://publicationethics.org/guidelines

**CONSENSUS STATEMENT ON SURGERY JOURNAL AUTHORSHIP - 2006**
In the majority of clinical and research studies submitted to surgery journals for possible publication, many individuals participate in the conception, execution, and documentation of each of those works. However, recognition of work in the form of authorship has varied widely. This consensus statement is being issued to clarify and define the criteria for surgical journal authorship.

The following guidelines should be used to identify individuals whose work qualifies them as authors as distinct from those who are contributors to the work under consideration. All persons designated as authors should qualify for authorship, and all those who qualify should be so credited.

**A. Authorship Criteria**
Individuals claiming authorship should meet all of the following 3 conditions:

1. Authors make substantial contributions to conception and design, and/or acquisition of data, and/or analysis and interpretation of data;
2. Authors participate in drafting the article or revising it critically for important intellectual content; and
3. Authors give final approval of the version to be submitted and any revised version to be published.

Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Allowing one's name to appear as an author without having contributed significantly to the study or adding the name of an individual who has not contributed or who has not agreed to the work in its current form is considered a breach of appropriate authorship.
Acquisition of funding, collection of data, contributing cases, or general supervision of the research group, of itself, or just being the Chair of the department does not justify authorship if the above criteria are not fulfilled.

B. Order of Authors
The order of authorship on the byline should be a joint decision of the co-authors. Authors should be prepared to explain the order in which authors are listed.

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When a large, multi-center group has conducted the work, the group should identify the individuals who accept direct responsibility for the manuscript. These individuals should fully meet the criteria for authorship defined above and editors will ask these individuals to complete journal-specific author and conflict of interest disclosure forms. When submitting a group-author manuscript, the corresponding author should clearly indicate the preferred citation and should clearly identify all individual authors as well as the group name.

D. Contributors Listed in Acknowledgments
All contributors who do not meet the criteria for authorship should be listed in an acknowledgments section. Examples of those who might be acknowledged include: individuals who allowed their clinical experience (i.e., cases) to be included, a person who provided purely technical help, writing assistance, or a department Chair who provided only general support. Financial and material support should also be acknowledged.

Groups of persons who have contributed materially to the paper but whose contributions do not justify authorship may be listed under a heading such as “clinical investigators” or “participating investigators,” and their function or contribution should be described - for example, “served as scientific advisors,” “critically reviewed the study proposal,” “collected data,” or “provided and cared for study patients.”

Because readers may infer their endorsement of the data and conclusions, all persons listed as contributors must give written permission to be acknowledged.

E. In Conclusion
This consensus statement is intended as a basic guide for authors. In the interest of promoting the highest ethics in surgical publishing and the surgical sciences, we ask that authors take these criteria into careful consideration when submitting a manuscript to a peer-reviewed surgical journal.
SESSION 3

Critique Manuscript Reviews

Bringing it all together:
Abstract review and the “rules” of publication

Critique abstracts
Discuss editorial misconduct and duplicate publication
Further discussion and questions

Articles:
Ethical Misconduct in Publishing: the Editors’ Perspective

Michael G. Sarr, MD,1 Andrew L. Warshaw, MD2

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2Harvard Medical School, Massachusetts General Hospital, Boston, MA, USA

Scientific publishing is a respected product of our profession. Its success is based on the assumption by editors and the readership of scientific journals that data presented are accurate, that the publication is based on the author’s work, and that it is a primary publication. Albeit rare, ethical misconduct in published scientific works does occur, which breeds mistrust of the academician and represents a major headache to editors. This short piece will address certain forms of ethical misconduct—duplicate publication, plagiarism, and false data.

The drivers for publication misconduct are fairly evident. “Publish or perish” is the often-quoted mantra of the ivory-tower-based academic surgeon or physician. Publication is perceived to be the propellant for promotion, recognition, and office appointments in local and national organizations, associations, and societies. In rare situations, especially in young investigators, ignorance of the guidelines of ethical publication practices may play a part. Whatever the cause, ethical misconduct cannot be (and is not) ignored by editors, department chairs, institutional offices of faculty affairs, and publishers—not only for their own parochial reasons, but also to preserve and maintain the trust of the scientific readership in the global process of scientific publication. The points outlined in this commentary are derived in part from replies to a questionnaire circulated to the editors of 10 major surgery journals and from the consensus statements published jointly in the journals edited by members of the Surgical Journal Editors Group,1,2 which meets annually to discuss common concerns and to develop consensus policies. The 8 highest concerns are listed in Table 1, several of which will be discussed here.

Authorship describes (and requires) involvement in the conception, design, and/or implementation of a study or in the writing of the manuscript. If there is no task that can reasonably be attributed to a particular individual, then that individual should not be credited with authorship.3 Some journals require attestation of the role each author plays, and some list the role of each author on a peer-reviewed publication. Being the department chairman should not justify or confer automatic authorship. While it is necessary to encourage collaboration to meet the complex needs of modern basic and translational science and clinical research, the majority of papers have multiple authors—but too often, too many. We recognize that many evaluation committees and National Institutes of Health (NIH) study sections tend to give credit to first and last authors and that those in the middle are often ignored, but an acceptable compromise may be to allow the authors to designate two (sometimes three) authors as “lead authors” to acknowledge equal contribution and responsibility for the work.

Duplication of already published material is probably the most common form of publication misconduct. Dual publication is not just simply the presentation of identical (or essentially identical) language and data but also the reuse of the same data for different purposes, republication with only a few more patients, or experiments without changing the substance or message or, conversely, carving out subsets of published data (salami-slicing) for reuse. Any republication of previously peer-reviewed material is considered unacceptable duplication...
Journals. After reviewing all these articles, they concluded these 3 journals that matched with 147 articles in other journals, because the 2 manuscripts are processed within that 3% of all the articles in those 3 journals during that year. If Internet publication follows journal publication, the journal publication must be referenced clearly. Early Internet publication of accepted, peer-reviewed papers by a journal, however, does not constitute duplication if both manuscripts are identical and covered by the same single copyright.

Plagiarism takes several forms. It includes the un referenced use of others' published and unpublished ideas, including research grant applications, whether verbatim or reworded. Plagiarism is, then, a failure of the creative process, not a flaw in its result. Willful and knowing submission of false data obviously constitutes fraud. In addition, use of data from sources not the author's own, falsely certifying originality, vouch ing for data that the sponsor cannot verify, flagrant omission of reference to the prior work of others, or failure to disclose potential conflicts of interest are also fraudulent actions to be condemned.

As more and more research is being funded by industry, the conditions set by the funding sponsor have the potential to bias, restrict, or otherwise discredit the research product or its presentation. Researchers should not enter into agreements that compromise their freedom to analyze data independently, prepare manuscripts, and publish them. Authors should describe clearly the role (or its absence) of the study sponsor in any aspect of the study and its publication. Editors may choose not to re review or publish articles based on studies conducted under conditions that allow the sponsor to control the data or its publication.

Journal editors rely heavily on the review process to certify the scientific and ethical validity of the work they publish. When a concern about possible misconduct is brought forward, the sequential process that we as editors of the journal Surgery may follow is:

1. Communication with authors for clarification
2. Further investigation when indicated
3. Notification of department and institutional/school authorities
4. Publication of a notice of retraction in the journal
5. Communication with other relevant journal editors
6. Restrictions on future publication

Further details can be found at: http://www.icmje.org and www.publicationethics.org.uk

### Table 1.

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<thead>
<tr>
<th>Ethical concerns of an editor</th>
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<td>Originality (duplication, incremental data, &quot;new angle&quot;)</td>
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<tr>
<td>Attributions to previous publications (author's, others')</td>
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<tr>
<td>Falsification</td>
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<tr>
<td>Republication (different language, different audience)</td>
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<tr>
<td>Appropriate authorship (number, contribution)</td>
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<tr>
<td>Clinical research: privacy (Health Insurance Privacy and Accountability Act [HIPAA]), institutional</td>
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<tr>
<td>review board approval</td>
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<tr>
<td>Animal care guidelines followed</td>
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<td>Commercial sponsorship and control of data</td>
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except for full manuscripts based on abstracts or expanded abstracts (e.g., Surgical Forum, Transplantation Proceedings), series expansion by >50%, different analyses to prove or disprove a different hypothesis, republication in a different language with appropriate citation of the original, or a substantially increased duration of follow-up deemed important (e.g., 5–10 years for cancer treatment). Simply republishing for a different audience or in a different specialty is not an acceptable argument in the age of electronic search and retrieval of articles. Similar principles have been espoused by the International Committee of Medical Journal Editors.

Several years ago, Schein and Paladugu reviewed the authors of all articles (n = 660) published in Surgery, British Journal of Surgery, and Archives of Surgery in the year 1998 and then cross-referenced the authors' names with the "literature." They identified 92 index articles in these 3 journals that matched with 147 articles in other journals. After reviewing all these articles, they concluded that 3% of all the articles in those 3 journals during that calendar year were involved in duplicate publication.

A related problem is contemporaneous submission. Most journals now require the author(s) to attest that the work submitted for review and potential publication has not been accepted for publication or has not been submitted concurrently to another journal for potential publication. The practice of contemporaneous submission is more difficult to detect (and prevent) until after publication, because the 2 manuscripts are processed within each journal's confidentiality protections. Occasionally, the dual submission comes to light, because the same reviewer sees both manuscripts, but most often, such contemporaneous submissions are invisible to editors and to reviewers.

Electronic publication presents another special issue. If data have appeared previously on the Internet, submission of that data for publication is considered duplication. If Internet publication follows journal publication, the journal publication must be referenced clearly. Early

### REFERENCES


Biomedical Industrial Sponsorship and Its Impact on the Medical Literature

Peter J. Morris, AC, FRS, FRCS

The Centre for Evidence in Transplantation, The Royal College of Surgeons of England and the LSHTM, University of London, 35-43 Lincoln's Inn Fields, London WC2A 3PE, UK

The pharmaceutical industry plays a vital role in the development of new drugs. The industry is involved at two levels. The first is in the design and discovery of new drugs, which may occur in their own laboratories or in the university environment. The second is the research and development that brings a drug onto the market as a result of clinical trials; the latter take place in the clinic in both university and nonuniversity institutions and, for the most part, are sponsored by industry.

The pharmaceutical industry is enormous, with an estimated annual worldwide budget of $6 billion for drug development. To put this into perspective, the market for prescription drugs in the United States was $130 billion during the year 2000, and in 2001 it was $150 billion plus £7 billion in the United Kingdom. The cost of bringing each new drug to market is estimated to range from $250 million to $800 million; and it is estimated that, on average, each day's delay in U.S. Food and Drug Administration (FDA) approval of a new drug costs $1 million per day. This is an enormous expenditure, but of course the potential profits are also enormous. Without question many drugs of significant value to mankind have arisen from the endeavors of the pharmaceutical industry. Nevertheless, it has also resulted in many drugs of the same type with similar efficacy and similar safety profiles (“me too” drugs) competing for the same population of patients. In the United Kingdom, the annual expenditure of the pharmaceutical industry on research, both basic and clinical, is £3.3 billion; and 90% of all clinical drug trials are financed by the pharmaceutical industry.

If most drug trials are sponsored by the pharmaceutical industry, does it influence the design of trials and the reporting of trials in a way that biases the medical literature? This could occur in a number of ways (Table 1). For example, when funding randomized trials, the company has the major input, if not the total input, into the design of the protocol. The selection of the comparator may thus be designed to show that the experimental drug has a more favorable outcome. There is also evidence that some trials are either not completed or not reported following completion presumably because of an outcome that was unfavorable to the company's product. It should be noted that, as of this year, publication by major journals requires that all randomized trials be registered with a trial registry in the public domain before a trial commences. This requirement will guard against selective reporting in the future. Indeed, Chalmers has said in the past that the failure to report findings from trials is scientific misconduct. There is also evidence that there is selective reporting of outcomes with respect to efficacy and safety. This is enhanced today by the prevalence of ghost writing by commercial writers employed by industry; and even though there is a so-called writing committee of trial participants, they often are responsible only for signing off on the finished report. These commercial writers are extremely skilled, and often a modest change in a sentence in the abstract or the conclusion can lead to an erroneous impression of the results of a trial. Finally, investigators or their units are reimbursed in a variety of ways for participating in the trial, which can again have an insidious influence on their attitude to the company supporting the trial and the experimental product as well as their subsequent interpretation of outcome.

There is a growing amount of evidence in the literature as to how industrial support does influence the medical
of clinical trials

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<th>Potential biases introduced by pharmaceutical industry support</th>
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<td>Inappropriate design of trials</td>
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<td>Need for regulatory approval</td>
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<td>Data analysis by company</td>
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<tr>
<td>Ghost writing of trial reports</td>
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<tr>
<td>Financial recompense to investigators and/or institution</td>
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Potential biases introduced by pharmaceutical industry support of clinical trials

- Inappropriate design of trials
- Failure to complete or report trials
- Selective reporting of safety and efficacy
- Need for regulatory approval
- Data analysis by company
- Ghost writing of trial reports
- Financial recompense to investigators and/or institution

literature. Lexchin and colleagues systemically reviewed the literature describing the source of funding and the outcome of trials and showed that the outcome in trials sponsored by industry was four times more likely to favor the sponsors' product than the studies not sponsored by industry. Another analysis of medical and surgical randomized trials by Bhandari and colleagues analyzed 332 randomized trials published between January 1999 and June 2001 in eight leading surgical journals and five leading medical journals. They analyzed 158 drug trials, 87 surgical trials, and 87 trials of other interventions, assessing all of these trials for the significance of the primary outcome as well as the quality of the study. In general, they found that trials funded by industry favored the new product being produced by the sponsoring company. This outcome was found in both surgical trials and drug trials, although the confidence intervals in surgical trials were quite wide.

Yet another interesting example of selective reporting of studies sponsored by the pharmaceutical industry was reported by Melander and colleagues. They analyzed 42 placebo-controlled studies of five selective serotonin reuptake inhibitors submitted to the Swedish Drug Regulatory Authority. Their analysis revealed multiple publications of the same studies, selected publication of the results, and selective reporting within those publications. They concluded that recommendations for an appropriate serotonin reuptake inhibitor from the publicly available data in the literature would be based on biased evidence.

A relevant study by Al-Nielsen and colleagues chose 25 eligible meta-analyses selected on predetermined criteria from a random sample of 167 Cochrane Reviews. These were all meta-analyses of drug trials. They found that the experimental drug was more likely to be recommended as the treatment of choice when the trial was funded by a for-profit organization (51%) in contrast to those funded by nonprofit organizations, where only 16% favored the experimental drug. Trials funded both by nonprofit and for-profit organizations fell somewhere between, with 35% favoring the experimental drug.

Many companies sponsor publication of the proceedings of symposia and indeed the symposia themselves; the subsequent publication is designed to attract wider attention to their product. Cho and Bera looked at the quality of drug studies published in symposium proceedings and, leaving aside the quality, they found that the outcome of a study published in a symposium proceedings was far more likely to be favorable to the experimental drug if the symposium and its publication was supported by a drug company.

The citations noted above are only a few examples drawn from a much wider literature, but they certainly indicate the bias that may be introduced by industry sponsorship for clinical trials and meetings. Some of the more obvious types of influence are mentioned above, but there are others that are much more difficult about which to provide evidence, such as premature termination of trials for financial reasons, incentives for academic investigators, bias in methodology, and withholding unfavorable results from publication.

Another area of possible concern is the financial recompense provided for investigators who are either participating in the trial or who make up a writing committee, for example, of a multicentre trial. This support is provided in a variety of ways, such as unrestricted research grants, educational grants, consultancies, travel awards, stock ownership, and generous payment to the institution or department for participation in a trial. Of considerable concern is that often "conflicts of interest" or competing interests are not declared at all in the published literature. For example, Choudhry et al. reviewed the relationships between authors of clinical practice guidelines and the pharmaceutical industry. Examination of 44 published guidelines revealed that in only 2 was there any declaration of a conflict of interest or sponsorship, whereas in his correspondence with the authors 87% had a financial interaction with industry. In what was a key study at the time, Stelfox and colleagues reviewed the debate that was rife at the time over the safety of calcium channel antagonists and any influence of industrial support on the author's opinion of the safety or otherwise of calcium channel antagonists. They reviewed original articles, reviews, and letters to the editors published on this issue around the time. They defined the author's position on the safety of calcium channel antagonists as critical, neutral, or supportive. Their findings were striking in that they found that the opinions expressed by the authors tended to be far more supportive than critical if they had a financial relationship with the manufacturer of the calcium channel antagonist. Surprisingly, the findings were the same if authors had a financial relationship with any manufacturer, even of a rival drug; but the striking finding was that authors who had no financial relationship.
with either a manufacturer of a calcium channel antagonist or any other company were not supportive and far more likely to be critical of calcium channel antagonists.

The financial relationship of authors with industry, as already mentioned, can be expressed in a number of ways: (1) support to attend a symposium; (2) honorarium to speak at a symposium; (3) support for an educational program; (4) research funding; (5) employment or consultancy; (6) holding of equity. This financial support, either direct or indirect, no doubt has the potential to influence the interpretation of outcomes in trials. Indeed, it would be naive to pretend that this is not so. Nevertheless, the lead taken by the major general journals and now many of the specialist journals in insisting on a full declaration of competing interests or conflicts of interest by authors of an accepted article does at least allow the reader to take this into account in their own interpretation of the data presented.

In conclusion, the pharmaceutical and biomedical industry has a vital role in the research and development of new drugs and technologies, and no one questions that. Furthermore, the successful marketing of their products does support their own research and development programs, which are an essential part of the development of new drugs and technologies. However, it should be realized that the interpretation of data from sponsored studies may be biased, for which there is increasing evidence (only a selection of which has been cited in this brief overview), and that the financial relationship of an investigator with industry has considerable potential to introduce bias. One must necessarily believe that the biomedical literature with respect to drug trials probably represents a biased literature. Nevertheless, although the pharmaceutical industry and academia each has a critical role in the development of new drugs and technologies, continuing efforts are required to regulate this interaction in such a way that one can be confident that the relevant medical literature is not biased in any way.

COMPETING INTERESTS

The author serves on two Data Monitoring and Safety Committees for multicenter trials sponsored by Roche and Bristol Myers Squibb, respectively, for which he receives an honorarium.

REFERENCES

Publishing in surgery: how and why?

Christophe Mariette · Guillaume Piessen · William B. Robb

Received: 17 April 2012 / Accepted: 31 July 2012 / Published online: 12 August 2012
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Abstract

Introduction Evidence-based medicine continues to have an increasingly important impact on all surgical departments, with the art of publication becoming a skill in its own right and occupying an ever more central role. However, it remains a challenge for any surgeon to publish their work. Purpose The aims of this educational review are to understand why, what and where surgeons should publish and provide surgeons with a guide regarding the publication process and the rules to be adhered to. Methodology This review targets (1) any surgeon beginning their scientific publication activity, (2) more experienced surgeons who wish to optimise their ability to have their work published and finally (3) leaders of research departments who aspire to improve the quality of their publications and their research productivity and profile.

Keywords Publication · Surgery · Impact factor · Journal · Review

Introduction

Scientific and surgical research productivity is being increasingly monitored and assessed, a process which has real implications for the funding and reputation of surgical departments. As a result, the art of publication for surgeons is occupying an ever more important role; however, it remains a challenge for any surgeon to have their work published. For young surgeons, it can be difficult to know what can be published, in which journal and how best to write a good paper; whilst for experienced surgeons, it is challenging to publish a relevant paper quickly, in a high impact factor journal, whilst avoiding repeated rejections. A publication activity evidently adds extra work to the practice of surgery, and consequently, it is a process which needs to be optimally time efficient. Despite its evident importance, the art of publishing is infrequently taught during medical education and specialised surgical training. The aims of this educational review are to understand why, what and where surgeons should publish, as well as the identification of some practical rules to act as a guide in successfully seeing work going to press. This review targets (1) all surgeon interested in beginning their publication activity, (2) more experienced surgeons aiming to optimise their publication success or (3) research department leaders who wish to improve both their publication quality and productivity.

Why should surgeons publish their work?

There is no contradiction in saying that the reasons for writing and publishing are on one hand personal and on the other altruistic. Personal reasons range from promotion within the academic and medical world, improvement of knowledge and opinions, recognition from colleagues, the development of professional contacts and even financial gain [1]. Altruistic reasons include the spread knowledge and the pursuit of further understanding. However, altruism may also influence the ego!

Academic promotion

The saying “publish or perish” is firmly anchored in academic life. It is difficult to climb the academic ladder without having
a number of publications in one's curriculum vitae. The progression of a university career, towards whatever title, leads to an increase in the number, and above all the quality, of publications, even if a publication record is not the sole factor which decides career progression.

Professional promotion

Professional promotion both leads to and follows from academic promotion. However, even for young surgeons without academic university ambitions, the presence of some publications on their CV makes today's or tomorrow's employers think that the candidate is capable of forming opinions and is interested in evaluating his results and sharing his experience with others. We should not forget that a number of pioneering publications were written by surgeons, outside the university world, who had a great deal of insight and whose work leads to greater professional awareness and respect from their peers.

Improved knowledge and judgement

Each published paper, from a clinical case to a randomised trial, contributes to the body of knowledge of a given subject. The act of publishing helps to improve understanding and the opportunities offered by medical knowledge and ultimately is certain to be of benefit to the patient. Any publication by a surgeon means that the subject matter is recorded for future reference and hence its impact is durable.

Acknowledgement

"Authorship of any sort is a fantastic indulgence of the ego". This statement, by JK Galbraith, is totally comprehensible in this context. There is clear human satisfaction to see one's name published or referred to by others. A surgeon whose articles are published in major reviews becomes "famous" beyond his own circle. Even if the surgeon's primary aim is to treat his patients, the satisfaction and acknowledgement derived from this can be short lived; however, the satisfaction and acknowledgement which follows from a high-quality publication endures even after a career has come to an end. Who would remember Rudolf Nissen today if his work had not been published [2]?

The development of professional contacts

A surgeon's reputation grows hand in hand with the volume of their publications, making the surgeon more attractive in the eyes of the world. The breadth of professional contacts which may follow increases the prospects and opportunities for publication and becomes the basis for subsequent exchange of ideas, improving the quality of the surgeon's own work. These professional links may become firm and with the development of real friendships which may also contribute to personal enrichment.

Financial advantage

Even if it is true that the time spent in writing could have been used for a more remunerative clinical activity, the promotion and reputation which accompany top quality publications may help with accessing a more prestigious surgical practice.

Altruism

The main reason for publishing is to share results, or simply reflections, with the surgical community. The main aim is the spread of new knowledge, and of course, there is a certain degree of moral obligation for surgeons to publish new results, whether they be positive or negative in nature. In many countries, academic research is now assessed in terms of volume and quality, with real consequences for the funding and financial wellbeing of a surgical department. For some, there are too many surgical journals and too many "nonsignificant" publications, meaning there cannot be simple reliance on the leading journals supplied by the major universities. Limiting the publication of journals to solely those of high impact would result in the creation of a false and biased image of surgical practice as it occurs in large high-volume centres. The wide distribution of views and results by an increasing number of surgeons and facilities via their own websites also means that such limitation is impractical.

What should a surgeon publish?

To publish, one must have something to say. Frequently, the first incentive for a young surgeon is the specific, unique or innovative case of a patient about whom he performs a literature search and produces a report within his department. Unfortunately, editorial pressure and a wish to increase a journal's impact factor have seriously reduced the possibilities of publishing such a clinical case report. However, this is still a good starting point, as it can arouse scientific curiosity, the desire for research and stimulate innovation.

Retrospective studies represent the next stage of advancement. These works are entirely suitable for publication, but it is essential for them to contribute something new in comparison with work already published on the subject. They must attempt to respond to a given question, with a suitable methodology and measurable aims (morbidity, mortality, survival). It is important to be aware of the methodological limitations as
well as the limitations of the conclusions which may be drawn from these studies. Finally, they must investigate a broad spectrum of variables, as it is clearly preferable to produce one excellent article covering all aspects than to split the results into several publications with a lower impact.

A technical article, based on the description of an original technical innovation, is often of interest, provided it has a fairly broad readership, with a significant number of patients treated with maximal follow-up. Certain influential examples are the production of an anti-reflux valve [2] and cholecystectomy via laparoscopy [3]. Even if the new development is of significant importance, surgical journals tend to only publish articles which describe them briefly.

Surgical research works, starting with an initial surgical hypothesis and seeking to find a response using an experimental model, are excellent sources for papers and offer an apprenticeship in the art of publication. The methodology selected may be the subject of a paper, as may the original results obtained, or it can be a review of the available literature based on a search of the available literature.

The observations made in preclinical or retrospective studies ought to justify additional prospective studies and final validation through randomised, controlled trials. The emergence of factual medicine as a discipline, the compilation of clinical trials within meta-analyses and the fact that recommendations about good clinical practices are based on levels of evidence underline the absolute necessity for surgeons to be involved in the process of rigorous scientific evaluation.

Setting up a randomised, prospective trial, as an investigator/coordinator is not often possible except within the setting of a large academic department, or increasingly as a regional, national or even international collaboration that requires significant expertise, finance and logistical support. On the other hand, participation in an already established randomised trial is within the reach of all types of departments and surgeons and is a simple way of participating in high quality clinical research. It is, nevertheless, extremely advantageous for surgeons to take part in the process of constructing a trial, from its first beginnings to design of its methodology, participation in data collection, analysis of the results and through to its submission for publication.

Reviews of literature form a significant part of surgical publication and in general are often referenced and quoted widely after their publication. The aim is to educate readers and have new findings summarised by specialists. A systematic review aims to chart the progress of a specific topic within medicine by a systematic analysis of the published evidence in scientific databases. If statistics are produced to compare groups of studies, then this is a meta-analysis. At the moment, systematic reviews are increasingly given to professional writers who are not surgeons, surgeons must not ignore this part of their scientific responsibility, especially as the value attributed to these works is increasing. Consequently, literature reviews written by surgeons are to be highly recommended and it is certainly possible, even if complex, for a surgeon to conduct a Cochrane review.

Editorials or articles about opinions are generally written by invitation of, or with the agreement of, an editor. It aims to provide a concise and impartial summary of a targeted subject, ending with a conclusion which reflects the understanding of the editorial board. Whereas editorials are mainly compiled by surgeons of considerable reputation, any surgeon may send a letter to the editor indicating his constructive opinion about work recently published in the pages of the same journal.

Presentation of research, whilst not a prerequisite to publication, is often extremely beneficial in developing a publication of high value. It allows for an initial evaluation of the project and facilitates an exchange of ideas with specialists in the topic, hence providing for an external opinion on both the results and working methodology. This often leads to improvements in the projected manuscript and better development of its discussion. The fact that there are many more published abstracts than accepted articles illustrates the difficulties involved in publication. Consequently, several journals attach a special importance to articles whose summary has already been accepted for presentation at a noteworthy conference (for example, the British Journal of Surgery), particularly if the journal and the conference are in partnership (for example, the Annals of Surgery and the European Surgical Association conference). Finally, what one has to bear in mind is the fact that it is advantageous to publish what one would like to read as a surgeon.

Where should a surgeon publish?

Selecting the journal in which the surgeon wishes to publish is an action to be taken even before starting to draft the manuscript.

The aims are usually as follows [5]:

- To gain as wide a readership as possible,
- The selection of a journal with an appropriate readership; for example, an article on surgical technique risks being of no interest to gastroenterologists,
- Attempting to publish in as prestigious a journal as possible, with a high impact factor (IF).
Optimising both the chances of acceptance and considering the likely time for the paper to be under review; it is always demoralising to have a paper rejected after a very prolonged and slow review process,

Minimising the risk of having an article either refused or having to undergo prolonged efforts at improvement prior to its acceptance. Even if everyone wants their article to be accepted from the very first submission, the reality is an average of two rejections before an acceptance [6].

These objectives do not always go together. Certain journals with a high IF have a small readership (one example being the American Journal of Transplantation IF 6.048) or certain journals with a wide readership may not being interested in the proposed subject. In the editorial world, the article is merchandise and so it is advisable for a surgeon to comprehend the “publication market” in order to understand the value of his article. It is only then that the manuscript can be tailored to the selected journal in order to correlate with that journal’s established targets.

The “market” for the surgical manuscript

Professional surgical journals are grouped together in classes, according to their reputation, evaluated in an arbitrary way by the IF. For a given journal in any given year, the impact factor is the average number of citations received per paper published in that journal during the preceding 2 years. So the IF 2010 of a journal is calculated from the number of references to articles published in 2008 and 2009 by the Institute for Scientific Information. In other words, the more frequently a journal’s articles are referenced by other authors, the higher its IF. As a result of this calculation, two vicious circles appear immediately. Journals with a high IF, such as Annals of Surgery (IF 7.474 in 2010), attract, thanks to their prestige, the best articles from highly reputed teams, which are subsequently often quoted, helping to further increase the journals’ IF. The opposite is true for more modest journals. Hepatogastronenterology is a journal with a much lower IF (IF 0.677 in 2010), hence attracting articles whose value is potentially lower and which frequently may have been previously rejected by previous reviews, is likely to be less often cited by others, with the corollary of a low impact factor. Even if numerous criticisms affect the performance of this tool, the IF remains the key value by which a journal, or even an article or an author, is evaluated. It is well known that the IF is only partially correlated with the level of importance determined by surgeons’ opinion [6].

In order to provide a more complete overview of how journals are ranked in relation to each other and to help guide the surgeon in sending his article to an appropriate journal, a simple classification of journals has been proposed [7]. The aim of this is to rank journals into five separate classes depending on an algorithm which consists of positioning a journal within its discipline. In practice, it is sufficient to classify journals according to their increasing IF and to divide them into four equal groups of numbers using quartiles. The 90th percentile (P90) is used to divide the fourth quartile and allow the 10% of journals with the highest IF to be isolated. Finally, the IF of the journal simply needs to be compared with the review at the quartiles and percentiles calculated in this way (Table 1). Group A corresponds to excellent journals, B to very good, C to average, D below average and group E to low quality journals. Table 2 classifies the main digestive surgery journals based on the IF of 2010. It should be noted that if a journal appertains to several disciplines, it is classified according to the quartile for all the journals in each discipline. This explains why there is not always a direct correlation between the IF and the classification rank.

How does a surgeon judge the value of his manuscript?

For most authors, particularly those at the outset of their careers, each completed study appears worthy of a wide and prestigious audience. In order to optimise the chances of manuscript acceptance, it is advisable to correctly evaluate the quality of one’s work so as to assess which are the best journals to target for publication. Table 3 ought to help everyone with this step [6].

How to select the right journal for a given article?

As far as possible, it is always necessary to pragmatically balance the aspiration of targeting a prestigious journal with an objective evaluation of the quality of the article to be submitted. This evaluation is not simple and requires experience, although the suggestions below should help with this step:

- Determine the audience: general or specialist, national or international. For a level II (Table 3) article about digestive surgery, a rank a surgical journal with a wide surgical audience must be sought. However, the option

| Table 1 Classification of journals according to quartiles and the 90th percentile |
|---|---|---|
| IF | Fracti of journals (%) | Rank of classification |
| < Q1 | 25 | E |
| Q1 < IF < Q2 | 25 | D |
| Q2 < IF < Q3 | 25 | C |
| Q3 < IF < P90 | 15 | B |
| IF ≥ P90 | 10 | A |

IF impact factor, Q quartile, P percentile
of aiming at a more specialised readership in a rank B journal (e.g., Diseases of Colon and Rectum) or a medical—surgical readership in a rank A journal (e.g., Gastroenterology) is equally valid. 

Read the instructions to the author: this can determine the preferred papers for each journal. All journals consider accepting original articles based on clinical data, but only some accept literature reviews, technical notes or clinical cases. Instructions to authors must be followed to the letter or the author risks their manuscript being directly refused.

- Read articles published in the target journal in order to assess the kind of subjects covered and the publication style.
- If the target journal has already recently published articles on the same topic as the work to be submitted, one should consider a different journal. If, on the other hand, the article is attempting to answer questions posed by previous articles, the same journal may be appropriately targeted.
- Some surgeons submit all their articles to a given journal or a small number of selected journals. This may be a good idea in that they know how to best meet the requirements of this journal and, overtime, the editorial committee comes to know them and the quality of their work.
- Selecting a journal also comes through the experience of submitting to journals. Just like clinical opinion, a decision relating to publication is acquired with experience and it is difficult to consign it to a simple algorithm. Advice from a surgeon who regularly publishes is always welcome, and it is worth bearing in mind that manuscript rejection is most frequently due to inappropriate journal selection [6].

Successful publication is increasingly complex, with ever-increasing rates of manuscript rejection occurring as a result of the constant rise in the quality of scientific activity. As an example, the rejection rate of the Annals of Surgery is 85% that of the British Journal of Surgery is 80% [6]. Selection of, and submission to, the appropriate journal remains fundamental to a successful outcome.

How do non-English speaking surgeons go about publishing?

English has become the international language of medical literature. The vast majority of medical journals publish in English, and several studies have shown that papers in English are by far the most frequently cited, with a citation average of 3.7 for an article in English, 0.6 for an article in German, 0.5 for an article in French and 0.5 for an article in Japanese [6]. Consequently, this means that the awareness and recognition of authors is greatly improved if a paper is published in English. Nevertheless, simple rules can be applied whilst bearing in mind the following concept: simplicity = clarity = effective communication. The aim is to publish quality papers to make advances in medical knowledge, but in order to have

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Table 2: Impact factor and rank of classification of the principal journals of digestive surgery in 2011

<table>
<thead>
<tr>
<th>Abbreviated journal title</th>
<th>Impact factor</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann Surg</td>
<td>7.492</td>
<td>A</td>
</tr>
<tr>
<td>Am J Transplant</td>
<td>6.394</td>
<td>A</td>
</tr>
<tr>
<td>Brit J Surg</td>
<td>4.606</td>
<td>A</td>
</tr>
<tr>
<td>J Am Coll Surg</td>
<td>4.549</td>
<td>A</td>
</tr>
<tr>
<td>Arch Surg</td>
<td>4.239</td>
<td>A</td>
</tr>
<tr>
<td>Ann Surg Oncol</td>
<td>4.166</td>
<td>A</td>
</tr>
<tr>
<td>Surg Endosc</td>
<td>4.013</td>
<td>A</td>
</tr>
<tr>
<td>Transplantation</td>
<td>4.003</td>
<td>B</td>
</tr>
<tr>
<td>Liver Transplant</td>
<td>3.386</td>
<td>B</td>
</tr>
<tr>
<td>Obes Surg</td>
<td>3.286</td>
<td>B</td>
</tr>
<tr>
<td>Dis Colon Rectum</td>
<td>3.132</td>
<td>B</td>
</tr>
<tr>
<td>Surgery</td>
<td>3.103</td>
<td>B</td>
</tr>
<tr>
<td>Transpl Int</td>
<td>2.921</td>
<td>B</td>
</tr>
<tr>
<td>J Gastrointest Surg</td>
<td>2.826</td>
<td>B</td>
</tr>
<tr>
<td>Ann J Surg</td>
<td>2.776</td>
<td>B</td>
</tr>
<tr>
<td>EJSO</td>
<td>2.499</td>
<td>C</td>
</tr>
<tr>
<td>Surg Oncol</td>
<td>2.444</td>
<td>C</td>
</tr>
<tr>
<td>Int J Colorectal Dis</td>
<td>2.385</td>
<td>C</td>
</tr>
<tr>
<td>World J Surg</td>
<td>2.362</td>
<td>C</td>
</tr>
<tr>
<td>J Surg Res</td>
<td>2.247</td>
<td>C</td>
</tr>
<tr>
<td>Surg Innov</td>
<td>2.126</td>
<td>C</td>
</tr>
<tr>
<td>J Surg Oncol</td>
<td>2.100</td>
<td>C</td>
</tr>
<tr>
<td>Hernia</td>
<td>1.843</td>
<td>C</td>
</tr>
<tr>
<td>Langenbeck Arch Surg</td>
<td>1.807</td>
<td>C</td>
</tr>
<tr>
<td>Clin Transplant</td>
<td>1.667</td>
<td>C</td>
</tr>
<tr>
<td>HPB</td>
<td>1.694</td>
<td>C</td>
</tr>
<tr>
<td>J Laparentendosc Adv</td>
<td>1.400</td>
<td>D</td>
</tr>
<tr>
<td>Surg Tech A</td>
<td>1.400</td>
<td>D</td>
</tr>
<tr>
<td>J Surg Educ</td>
<td>1.376</td>
<td>D</td>
</tr>
<tr>
<td>BMC Surg</td>
<td>1.333</td>
<td>D</td>
</tr>
<tr>
<td>Am Surg</td>
<td>1.285</td>
<td>D</td>
</tr>
<tr>
<td>Ann Roy Coll Surg</td>
<td>1.231</td>
<td>D</td>
</tr>
<tr>
<td>Surg Lapuro Endo</td>
<td>1.117</td>
<td>D</td>
</tr>
<tr>
<td>Per Tech</td>
<td>1.224</td>
<td>D</td>
</tr>
<tr>
<td>Digest Surg</td>
<td>1.224</td>
<td>D</td>
</tr>
<tr>
<td>Surg Today</td>
<td>1.224</td>
<td>D</td>
</tr>
<tr>
<td>Digest Endosc</td>
<td>1.194</td>
<td>D</td>
</tr>
<tr>
<td>World J Surg Oncol</td>
<td>1.120</td>
<td>D</td>
</tr>
<tr>
<td>Eur Surg Res</td>
<td>0.932</td>
<td>E</td>
</tr>
<tr>
<td>Hepatogastroenterol</td>
<td>0.658</td>
<td>E</td>
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</tbody>
</table>
a real impact, everything must be properly understood. Ideally, an article compiled in English should be revised by a surgeon for whom the English language is their mother tongue, or it may be directly rejected by the editor. Editors give preference to all articles which are well written and easily comprehensible. Among the key points for success, one can suggest the following:

- Only discuss one idea per sentence
- Using paragraphs judiciously to group together a body of ideas and thus make the article easy to read
- Eliminate superfluous words
- Avoid redundant sentences
- Always try to select the shortest and clearest word or sentence
- Write using the active voice
- Avoid ambiguities
- Use a similar grammatical construction for each sentence
- Make sure that verb tenses are appropriate and consistent
- Avoid repeating facts or results all the way through the article, especially in the discussion
- Always compile the summary last, after analysing the results and determining their meaning
- As the title is the most important phrase in the article, select it carefully: it must be brief and concise, contain the main key words, be dynamic and must not contain abbreviations. It must also be informative, “catchy”, promise to contain an original message or respond to a well-known problem.

Which publication rules should be applied?

The list of authors is an important point and may be a source of conflict. In fact, the ranking of authors may have an impact on their academic profile, their future promotion and their ability to obtain further research funding and grants and in some countries, due to the funding subsequently paid to their departments, may also have some effect on their income. Authorship is merited by those who have made a substantial contribution to study conceptualisation, methodology, data recovery, analysis of results and manuscript preparation [8, 9]. The authors must be listed in a decreasing order of their contribution to the work. Those who have taken part to a lesser degree will be quoted in the acknowledgements. It is customary to mention the head of department or the team leader as the final author, whereas in fact, this position should be reserved for the designer of the work—the “brain” behind the study. The recommendation is not to automatically position the head of department as one of the coauthors, unless he has been actively involved in the work. Operating on patients is not an adequate contribution in itself in any department, the role of the senior medical figure is to create an environment conducive to the development of academic studies and publications and also to allow more junior team members to grow and acquire their own intellectual independence. The person who compiles the manuscript must be listed as the main author, preferably a junior surgeon. The included author for multicentre and/or cooperative studies must be the declared team investigator for the study, in a decreasing order of the number of patients included. It is possible to have a second signatory from the same team depending on the total number of patients included.

In all cases, it is essential for the rules about the order of authors be established from the outset of the work, bearing in mind that certain journals limit the number of authors and may ask for their participation to be justified.

Conclusion

With the growing assessment of both the quality and quantity of academic productivity and its increasingly important
impact on surgical departments, the art of publication is occupying a more and more central role. A strong publication record heightens a surgical team’s profile amongst their peers and facilitates the development of both a national and international surgical leadership role in the implementation of treatments according to best practice. Such a profile also allows for more frequent inclusion in research collaborations concerning the most cutting edge or current themes. The motivation to publish must not be limited to personal and departmental promotion but must also give fledgling surgeons the opportunity to develop an inquisitive approach to surgical practice and a desire to promote their surgical department at both a national and international level. We are what we write.

Acknowledgments The authors thank Pr Olivier Soubrane for its expert advice.

Conflicts of interest None.

References

5. Tompson A (2006) How to write an English medical manuscript that will be published and have impact. Surg Today 36:407-9
Academic Surgery: The Scalpel and the Pen

.....or everything you need to know about Scientific Writing, but were afraid to ask

John G Hunter
Mackenzie Professor and Chair, Surgery, Oregon Health and Science University

The Three Legged Stool of Academic Medicine

Teaching

Healing

Discovery
"Dr Hunter, I learned a fair amount of surgery from you, but I really learned how to write..."
- Laparoscopic fellow Ted Trus MD 1996

Qualifications

- Background in English language and literature
- Written a lot of abstracts, papers, and book chapters
- Edited a few books
- Editor of a surgical journal -9 years
Everything You Wanted to Know About Writing, Editing and Publishing

- Why is this important?
  - Academic prowess measured by number of articles published
  - Publication deficiency is the single greatest barrier to promotion
  - Drives many bright people from academics
  - Writing is not "easy" for anyone
  - Competent editing requires writing skills
  - Editorial misconduct perceived or real destroys reputations - be wary!

Writing for Surgeons – A Focus on Common Errors

- Overcoming "Writer's Block"
- The Abstract
- How long should it be?
- Authorship Requirements
- Picking a journal- journal metrics
- Surviving Peer Review
- Accepting Rejection
Overcoming “Writer’s Block”

• Getting started is the hardest part
• No shame in resorting to crutches
  – Dictaphone
  – Modular writing – start with what is at the top of the mind
  – Deadlines are a must for almost everyone

Overcoming “Writer’s Block”

• Find an environment with no distractions
  – Long drives
  – Walking around
  – Borrowed beach house or motel room
• Eliminate distractions in common environment
  – Hard to control this one
The Abstract – all meat, no potatoes

• Language precision
  – Avoid needless words *
  – Avoid needless abbreviations
• Write the first draft without worry about word counts
• After reading the abstract there should be no surprises in the article

*The Elements of Style – Strunk and White

Introduction, Methods, Results, Discussion-General Considerations

• Length
  – Abstract – 250 words
  – Review article <3500 words
  – Original scientific presentation <2500 words
  – Brief technical report <1500 words
  – Editorial 1000 -1500 words
  – Commentary 500-1000 words
  – Letter to the Editor 250-500 words
Avoid Gift Authorship

- Common Practice
  - Chairman of the Dept
  - Family member, close colleague, etc
  - Famous Person in another Department
    - Helps bring name recognition to the article
- Recipient of the gift – awkward position
  - Responsible for the shortcomings of the article
- It's OK to be stingy with the author list

PICKING A JOURNAL FOR YOUR "BABY"

Submitted to WJS January, 2011

Manuscript ID WJS-11-01-0093 entitled "Use of chitosan and polypropylene in the surgical correction of penile deviation in bulls: clinical and histological aspects" with Dr. X as contact author has been submitted to the World Journal of Surgery.
Picking a Journal for your “baby”

- Impact Factor
  - IF (2 year)- Number of citations in a particular year, in any indexed journal, to articles published in a particular journal over the prior two years, divided by total number of articles published in that journal
  - e.g. 1500 citations in 2010 to 500 articles published in 2008 and 2009 (1500/500) = IF of 3.0
- Journal impact factor of ones publication may matter for promotion
- Citation frequency of YOUR paper is dependent on its quality and individual impact in the field

The Problems with Impact Factor

- Doesn’t Pass the ‘Face Validity Test’
  - Small, niche journals with lots of self citation are high on the list
  - Cited articles and downloaded articles (usage) rarely correlate
- Rewards the publishing of firsts, no matter how good or how responsible
- Difficult to manage to, and quite capricious
Alternatives to Impact Factor

• Google Scholar – h factor
• 5 year- must publish >100 articles
  – number of articles (x) cited x times in 5 years. (if h-5=52, then 52 articles were cited 52 times in 5 years)

• Advantages
  – Takes into account longer period of usage
  – Is not dominated by a few articles
  – Rewards the publication of more articles

Altmetrics

• Focuses on the single article
• Answers the question: What kind of traffic did this article get?
  – Tweets, postings, blogs
  – News articles in any form of media
  – Not just citations and usage
• This might be the true IMPACT factor
Blinded Peer Review

"Memoirs sent by correspondence are distributed according to the subject matter to those members who are most versed in these matters. The report of their identity is not known to the author."

Royal Society of Edinburgh, Medical Essays and Observations (1731)

Many forms of Government have been tried and will be tried in this world of sin and woe...
Indeed, it has been said that democracy is the worst form of government except all those other forms that have been tried from time to time.

Winston Churchill, House of Commons (11 Nov, 1947)
Surviving Peer Review

- Less than 1% of manuscripts are accepted without revisions
- Follow the rules outlined
  - Answer the reviewers questions point by point
  - Add your answer to the manuscript (indicate where in point by point)
  - Don’t argue with the reviewers
  - When 2 reviewers ask for opposite things, point this out to editor and choose for yourself who to follow

Rejected Manuscripts

- There is almost always a ‘home’ in an indexed journal
- Revise after rejection, if possible
  - Next reviewer might be the same as your last
  - Consider revising your “limitations” paragraph
- Don’t let the data age – update it
"Dear Dr Marshall: I regret that your research paper was not accepted for presentation. The number of abstracts we receive continues to increase. For this meeting, 67 were submitted and we could only accept 56."

Don’t Give UP!

Remember ……

Victory goes not to the brightest or strongest, but to the most persistent
Gastric Ischemic Conditioning Prior to Esophagectomy is Associated with Decreased Stricture Rate and Overall Complications

**Brief Title:** Ischemic Conditioning Prior to Esophagectomy

**Funding:** This study received no funding

**Manuscript Word Count:**

- Tables: 4
- Figures: 0
- Pages: 19 double-spaced (Including title & accessory pages)
Abstract

**Background:** Gastric ischemic conditioning prior to esophagectomy can increase neovascularization of the conduit. Our aim was to analyze the association between gastric conditioning and all anastomotic outcomes in our cohort of esophagectomy patients.

**Study Design:** We performed a retrospective review of patients undergoing esophagectomy from 2010 to 2015 in a National Cancer Institute center. Ischemic conditioning (IC) was performed on patients requiring feeding jejunostomy, and those with active tobacco abuse or with concurrent tobacco abuse and diabetes. Ischemic conditioning consisted of ligation of the short gastric and left gastric vessels. Primary outcomes investigated all postoperative conduit complications. Secondary outcomes included any other postoperative complication.

**Results:** Two-hundred and seven esophagectomies were performed with an average follow up of 19 months. Thirty-eight patients (18.4%) underwent conditioning (IC). This group was similar to patients not conditioned (NIC) in age, body mass index (BMI), preoperative pathology, and surgical approach. The prevalence of smoking history was higher in the conditioning group (81.6% vs. 68.1%), but not significantly (p=0.10). Ischemic conditioning did not significantly reduce the rates of ischemic conduit (0% vs. 2.4% p=0.34), anastomotic leak (7.89% vs. 5.33% p=0.54), discontinuity/staged procedure (2.63% vs. 3.55% p=0.78) or fistula formation (0% vs. 1.78% p=0.41). However, IC patients did experience significantly fewer overall complications (36.8% vs. 56.2% p=0.03). Ischemic conditioning significantly reduced the postoperative stricture rate four-fold (5.3% vs. 20.7% p=0.02).

**Conclusion:** Gastric ischemic conditioning may lower the rate of postoperative stricture and overall complications in selected patients undergoing esophagectomy. Randomized studies may determine optimal selection criteria to determine who best benefits from ischemic conditioning.

**Keywords:** Ischemic Conditioning, Esophagectomy, Anastomotic complication, esophageal cancer
Introduction

Detection of esophageal cancer is increasing worldwide, with nearly half a million incident cases in 2008.[1] In the United States, adenocarcinoma of the esophagus has a rising incidence and overall 5-year survival is estimated to only be approximately 15%. [2] While surgical outcomes for esophageal resection have steadily improved over time with the advent of minimally invasive techniques and improved perioperative care, the average mortality after esophagectomy ranges from 1% to 9%, with an estimated morbidity as high as 80% after resection.[2-6]

Though the majority of morbidity after esophagectomy pertains to pulmonary complications, the most concerning morbidity is due to anastomotic complications.[3] Ischemia of the gastric conduit occurs in approximately 9% of esophagectomy cases, postoperative anastomotic stricture in 9% to 20% of cases, and anastomotic leak in 1 – 20% of cases with an associated mortality of 2-12%.[7-9] Anastomotic leaks are associated with increased hospital length of stay and morbidity and can lead to future stricture formation.[8] Though the etiology of anastomotic complications is likely multifactorial, tissue ischemia of the newly formed gastric conduit is a key factor in the development of these dreaded complications.

Ischemic conditioning (IC) of the gastric conduit was first described nearly twenty years ago and has shown improvement in blood flow to the future site of anastomosis by hypertrophy and neovascularization from the remaining feeding artery.[9, 10] Though some published reports have shown reduction in the incidence and severity of anastomotic leaks after ischemic conditioning, these results have not been reliably reproduced.[8, 11, 12] Moreover, the majority of IC studies were designed to analyze improvement in anastomotic leak outcomes and neglect other important anastomotic complications.

The purpose of our study is to determine if gastric ischemic conditioning is associated with a reduction of overall post-esophagectomy morbidity, including the need for subsequent
interventions. Specifically, we sought to identify an association between gastric ischemic conditioning and a reduction in anastomotic complications.

Methods

Patient Selection

We performed a retrospective review of a prospectively maintained esophageal disease registry from a single National Cancer Institute center at the Oregon Health & Science University. Patients undergoing an esophagectomy from January 2010 to December 2015 were included in the study. Those with either benign or malignant disease were included in this analysis. Available demographic, laboratory and staging data were collected through chart review. Preoperative medical comorbidities were tracked and recorded and age-adjusted Charlson Comorbidity Index (CCI) was calculated. All surgical procedures were performed by one of three institutional foregut specialist surgeons. There were no exclusions based on type or approach of esophagectomy. Patients were excluded if their clinical data were incomplete.

Ischemic Conditioning

Patients were selected for ischemic conditioning (IC) if they required operative feeding jejunostomy placement prior to esophagectomy due to an inability to adequately achieve oral intake. In this group, ischemic conditioning was completed at the time of feeding tube access. Patients considered to be at higher risk of perioperative complications (those with active tobacco use and diabetic patients with active tobacco use) were also selected for IC as well. The ischemic conditioning procedure was performed with a laparoscopic approach and consisted of ultrasonic ligation of the short gastric arteries and clipping of the left gastric vessels. Patients were then discharged after recovery from surgery and all patients with malignancy followed oncologic standard of care.
Statistical Analysis

The primary outcomes of this study were post-esophagectomy anastomotic complications. This included anastomotic leak, stricture, conduit ischemia, and fistula formation. Staged procedures and with gastrointestinal discontinuity due to conduit ischemia at the index surgery were also a primary outcome of interest. Anastomotic leak was defined by either a positive radiographic finding on esophagram or by local examination due to clinical concern. Conduit ischemia was defined by pale or blue-black mucosal changes on visual or endoscopic examination. Anastomotic strictures in the absence of recurrent disease were identified by symptomatic dysphagia with radiographic or endoscopic confirmation requiring endoscopic dilation. Cutaneous fistula was defined as a break in the epidermis with output consistent with gastrointestinal fluid or oral secretions.

Secondary outcomes included overall postoperative morbidity. This was defined as any of the following postoperative complications: respiratory/cardiac/renal/gastrointestinal complication or failure, deep venous thrombosis, surgical site infection, bleeding/thrombotic complication, mechanical ventilation > 48 hours, or intensive care unit transfer.

Patients were compared based on the presence (IC) or absence of (NIC) preoperative ischemic conditioning. Categorical variables were analyzed using chi square test with a Fischer’s exact test for variable counts less than five. T tests were used for continuous variables. A p-value of 0.05 delineated statistical significance. Additional bivariate analyses were performed to identify factors associated with overall morbidity and specific anastomotic complications, including stricture. Factors that were significantly associated with stricture and overall morbidity (including IC) were entered into a multivariate logistic regression model. Statistical analysis was completed in the SAS System® package for Windows (Version 9.4, Cary, NC).
Results

Overall Patient Cohort

We identified 207 patients over the study period. The majority of the study population was male; 172 patients (83.1%). The average age in the overall study was 65 years (range 24 – 82) with a mean body mass index (BMI) of 27 (range 15.6 – 46). Sixty-one patients (29.5%) never used tobacco while 128 (61.8%) were former users and 18 (8.7%) patients were active users at the time of referral with an average pack-year history of 21.4 (range 0-165). Thirteen patients (6.3%) underwent esophagectomy for benign diagnoses. Nine patients had achalasia, two with esophageal atony, one with refractory gastroesophageal reflux, and one patient with refractory stricture disease. The remaining 194 patients had cancer (11.1% squamous cell carcinoma, 79.7% adenocarcinoma) or high grade dysplasia (2.9%). The average Charlson Comorbidity Index was 4.7 (range 0-11). The mean follow up time in the study population was 14.1 months.

Ischemic Conditioning

Thirty eight patients (18.4%) underwent ischemic conditioning prior to esophagectomy. Demographic, comorbidity and disease-specific data are displayed in Table 1. This group was 76% male (29 patients), with an average age of 64.3 years. The mean BMI of 24 was significantly less than the NIC group (mean = 26.5, p=0.002). The majority of the IC group (81.6%) were previous or current tobacco users. Diabetes was statistically less common in the IC group compared to the NIC group (7.9% vs. 21.9%, p=0.048). The incidence of other comorbidities as well as the mean age-adjusted Charlson Comorbidity Index was similar between the two groups. Only one patient who underwent IC had benign disease (achalasia) compared to 12 patients (7.1%) in the group who did not undergo ischemic conditioning. The majority of patients in both groups had malignant disease, though there was no difference in the type of malignancy between groups (p=0.896). In addition, the two groups did/did not differ with regards to clinical stage.
prior to surgery ($p=??$). Nearly all patients in the IC group with malignancy underwent preoperative chemoradiotherapy (CRT), while 71% of the NIC group had CRT. The rates of neoadjuvant radiation between groups were statistically similar ($p=0.38$), though there was a statistically higher rate of neoadjuvant chemotherapy use in the IC group (94.7% vs. 71.6%, $p=0.003$).

**Operative Data**

The majority of patients in the both groups underwent a minimally invasive resection ($p=0.70$). Surgical data are presented in Table 2. In both groups, the anastomosis was most commonly stapled ($p=0.104$) and located in the neck ($p=0.105$). The overall most common operation was a minimally invasive, three-field (McKeown) approach.

**Outcome Data (Table 3)**

The incidence of overall morbidity after esophagectomy in the ischemic conditioning group was 36.8% compared to 56.2% in the NIC group ($p=0.031$). The most common morbidity in both groups was due to pulmonary complications (pneumonia and respiratory failure). The incidence of pneumonia was not significantly different between both groups, approximately 11%, though there were more cases of respiratory failure requiring prolonged and re-intubation in the NIC group (12.4% vs. 7.9%, $p=NS$). Other rates of complications did not differ between groups.

Five patients in the ischemic conditioning group (13.2%) and 57 patients (33.7%) in the group that did not have ischemic conditioning experienced anastomotic complications ($p=0.011$). There were no difference in specific anastomotic complications (anastomotic leaks, cutaneous fistula formation, ischemic conduit, need for discontinuity) between groups, with the exception of strictures. Only two patients in the IC group (5.3%) had postoperative strictures requiring dilation compared to 35 patients (20.7%) in the NIC group ($p=0.025$).
Bivariate analysis was also completed to identify factors associated with overall morbidity and postoperative stricture (Table 4). Tobacco use, body mass index and vascular disease were not significantly associated with overall morbidity or postoperative stricture (p>0.05). Male gender (p=0.049), history of diabetes (p=0.036), neoadjuvant chemotherapy (p=0.017), and older age (p<0.001) were all associated with postoperative morbidity. A higher mean Charlson Comorbidity Index was associated with overall morbidity (p<0.001) as well as postoperative stricture (p=0.046). A larger portion of patients with postoperative morbidity underwent an open surgical approach (8.3%) than those that did not experience morbidity (1%, p=0.032), though surgical approach was not statistically associated with postoperative stricture.

Logistic regression modeling was then completed for the variables with significant associations in the bivariate analysis. Age, gender, Charlson Comorbidity Index, diabetes, neoadjuvant chemotherapy, and surgical approach were not significantly associated with overall morbidity (p>0.05). However, ischemic conditioning continued to be significantly associated with reduced overall morbidity with an (OR 0.41, 95% CI 0.18-0.89) on logistic regression. There were no significant factors associated with postoperative stricture in our logistic regression model.

Discussion

Despite advancements in the care of esophageal disease, esophagectomy remains a morbid procedure owing to the large extent of dissection, organ resection, and anastomosis in fundamentally nutritionally deplete patients. Our study suggests that preoperative gastric ischemic conditioning may play a role in the mitigation of these complications.

Anastomotic complications such as conduit ischemia, anastomotic leak, stricture, and fistulization may all share a common etiology of poor microperfusion to the site of anastomosis. Akiyama and colleagues [10] were one of the first groups to study techniques to improving gastric cardia blood flow prior to esophagectomy and esophagogastric anastomosis in humans. In
54 patients, the authors embolized the left gastric artery, right gastric artery and splenic artery. Blood flow was then measured through a laser flow meter. This group was compared to 25 control patients and was noted to have higher blood flow in the gastric tube, less reduction of tissue blood flow after conduit creation, and less frequent blood flow below 5ml/min/100gm. Anastomotic leakage occurred in 2% of the embolization group versus 8% of controls. Subsequent studies have demonstrated improved anastomotic and mucosal blood flow and microvasculature, reduced collagen deposition and inflammation, and increased muscularis propria preservation.[14-16] Despite promising studies detailing improved perfusion and reduced inflammation, clinical outcome data have been mixed.

A 2016 review of ischemic conditioning by Kechagia et al [8] included 16 clinical studies along with a meta-analysis of 12 comparative studies. The authors concluded that IC has promising results with regard to reducing the incidence and severity of anastomotic leak, however pooled analysis was unable to demonstrate statistically significant differences. A large portion of clinical studies to date have not shown a reliable benefit in the reduction of anastomotic complications [8, 12]. Furthermore, the majority of studies have focused solely on the reduction of anastomotic leaks, at the exclusion of other important anastomotic complications.

In 2013, Markar et al [11] preformed a meta-analysis of factors affecting anastomotic integrity. They examined twelve studies compromising 1,215 patients that compared IC to control groups and showed a reduced rate of anastomotic leak in the IC group, though this did not demonstrate statistical significance. Of these studies, only one paper analyzed anastomotic complications other than leaks. Nguyen et al [17] retrospectively studied 81 patients who underwent IC, compared to 71 patients who did not. There were no statistical differences between these two groups with regards to outcomes. What is remarkable, however, is that the IC group had a greater proportion of anastomotic leaks and stricture, in addition to major and minor complications.
Our series of 207 consecutive esophagectomy cases supports prior literature with regard to the safety and feasibility of laparoscopic ischemic conditioning. Furthermore, we were able to demonstrate that ischemic conditioning is associated with less morbidity and overall anastomotic complications. The IC group had a statistically reduced incidence of overall complications compared to the NIC group. Though the rates of pneumonia and surgical site of infections between groups were similar, the IC group experienced less episodes of respiratory failure (reintubation, prolonged mechanical ventilation), pulmonary embolism, and stroke. Additionally, less patients suffered from a postoperative chylothorax.

The ischemic conditioning group had statistically fewer overall anastomotic complications. While there was a marginally higher incidence of anastomotic leak amongst the IC group (7.9% vs 5.3%), this was not statistically different. This parallels the bulk of the established literature in that a consistent significant reduction in anastomotic leaks has not reliably been replicated across studies. In this study, ischemic conditioning was statistically associated with a four-fold reduction (5.3% vs. 20.7%, p=0.025) of postoperative strictures, and patients who had IC required, on average, fewer dilations than those who did not have ischemic conditioning though this difference did not achieve statistical significance. This is in sharp contrast to a previous study demonstrating a 30% stricture rate after IC and a 25% stricture rate without IC.[17]

This study demonstrates that ischemic conditioning a safe adjunctive procedure that may be associated with reduced morbidity and postoperative strictures after esophagectomy. These reductions could be explained by a few factors. Most importantly, as previously demonstrated, ligation of the gastric blood supply causes hypertrophy, dilation and neovascularization of the remaining feeding vessel that improves blood flow to the future site of conduit anastomosis which has been associated with increased tissue oxygenation and reduced inflammation.[10, 14-16]

Another possible explanation is that because the gastric conduit is mobilized, ischemic conditioning reduces the overall operative and general anesthesia time during the subsequent
esophagectomy, which carries its own inherent benefits. Furthermore, in this study, patients who underwent IC often had preoperative feeding tubes placed due to inability to tolerate oral intake (frequently due to obstructing cancers). These patients where then given optimized nutrition under close supervision leading up to their index surgery. This is in contrast to patients who did not have dysphagia or an obstructing cancer who were able to tolerate some degree of oral intake, but may not have benefited from full nutritional optimization. Nutritional laboratory information was not available for all patients in this study and we recognize this as a limitation in the analysis of this hypothesis.

Other limitations to this study exist. Due to the retrospective nature of this study, statistically significant differences can best be defined as associations of the outcome, rather than a prediction. Furthermore, since this study was not randomized there is a significant selection bias which may contribute to reduced complications seen in the IC group, as discussed with regard to nutritional status. However, IC patients were selected based on clinical suspicion for vascular disease or inability to tolerate oral intake due to an obstructing cancer, both markers for increased patient comorbid illness and advanced cancer, respectively. As a result, one would expect worse outcomes in this group, though this study demonstrated more favorable outcomes. Lastly, though average follow up times between groups was adequate, we did not have long-term follow up on a small number of patients. These patients may have experienced anastomotic complications after they were lost to follow up. However, as a tertiary care referral center with established relationships throughout the region, this is unlikely.

Conclusion

In conclusion, gastric ischemic conditioning may lower the overall morbidity of esophagectomy and reduce the rate of postoperative stricture by as much a four-fold. It is not known which patients would most benefit from ischemic conditioning. Randomized studies are needed to determine optimal ischemic conditioning selection criteria for patients undergoing esophagectomy.
Disclosures

The authors of this paper have no financial disclosures

References

Table 1 - Demographic and Preoperative Data

<table>
<thead>
<tr>
<th></th>
<th>Ischemic Conditioning (IC) n = 38</th>
<th>No Ischemic Conditioning (NIC) n = 169</th>
<th>p Value</th>
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<tr>
<td><strong>Males n(%)</strong></td>
<td>29 (76.3)</td>
<td>139 (82.3)</td>
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<tr>
<td><strong>Age (years) mean [range]</strong></td>
<td>64.3 [49.8 - 79.4]</td>
<td>65.8 [24.3 - 82.7]</td>
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<td><strong>BMI (kg/m²) mean [range]</strong></td>
<td>24.0 [18.7 - 34.3]</td>
<td>26.5 [18.7 - 35.6]</td>
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<td><strong>Tobacco Use n(%)</strong></td>
<td>31 (81.6)</td>
<td>115 (68.0)</td>
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<tr>
<td><strong>Diabetes n(%)</strong></td>
<td>3 (7.9)</td>
<td>37 (21.9)</td>
<td>*0.048</td>
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<td>18 (47.4)</td>
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<td>1 (2.6)</td>
<td>12 (7.1)</td>
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<td><strong>Achalasia n(%)</strong></td>
<td>1 (2.6)</td>
<td>8 (4.7)</td>
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<td>37 (97.4)</td>
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<td>1 (3)</td>
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<td>13 (39.4)</td>
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<td>19 (57.6)</td>
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<td>36 (94.7)</td>
<td>121 (71.6)</td>
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*Statistically significant value (p<0.05); BMI - Body Mass Index
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<th>Table 2 - Operative Data</th>
<th>Ischemic Conditioning (IC) n = 38</th>
<th>No Ischemic Conditioning (NIC) n = 169</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surgical Approach</strong></td>
<td></td>
<td></td>
<td>0.700</td>
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<tr>
<td>Minimally Invasive n(%)</td>
<td>37 (97.4)</td>
<td>159 (94.1)</td>
<td></td>
</tr>
<tr>
<td>Open n(%)</td>
<td>1 (2.6)</td>
<td>9 (5.3)</td>
<td></td>
</tr>
<tr>
<td>Hybrid n(%)</td>
<td>0 (0)</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Anastomosis Type</strong></td>
<td></td>
<td></td>
<td>0.104</td>
</tr>
<tr>
<td>Stapled n(%)</td>
<td>35 (92.1)</td>
<td>158 (93.5)</td>
<td></td>
</tr>
<tr>
<td>Hand Sewn n(%)</td>
<td>2 (5.3)</td>
<td>11 (6.5)</td>
<td></td>
</tr>
<tr>
<td>Discontinuity n(%)</td>
<td>1 (2.6)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Anastomosis Location</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Chest n(%)</td>
<td>3 (7.9)</td>
<td>12 (7.1)</td>
<td></td>
</tr>
<tr>
<td>Neck n(%)</td>
<td>34 (89.5)</td>
<td>157 (92.9)</td>
<td></td>
</tr>
<tr>
<td>Discontinuity n(%)</td>
<td>1 (2.6)</td>
<td>0 (0)</td>
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</table>
Table 3 - Overall Morbidity and Anastomotic Complications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Ischemic Conditioning (IC)</th>
<th>No Ischemic Conditioning (NIC)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Morbidity n(%)</strong></td>
<td>14 (36.8)</td>
<td>95 (56.2)</td>
<td>*0.031</td>
</tr>
<tr>
<td>Pneumonia n(%)</td>
<td>4 (10.5)</td>
<td>20 (11.8)</td>
<td></td>
</tr>
<tr>
<td>Respiratory Failure n(%)</td>
<td>3 (7.9)</td>
<td>21 (12.4)</td>
<td></td>
</tr>
<tr>
<td>Surgical Site Infection n(%)</td>
<td>3 (7.9)</td>
<td>14 (8.3)</td>
<td></td>
</tr>
<tr>
<td>Chylothorax n(%)</td>
<td>1 (2.6)</td>
<td>8 (4.7)</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Embolism n(%)</td>
<td>0 (0)</td>
<td>3 (1.8)</td>
<td></td>
</tr>
<tr>
<td>Stroke n(%)</td>
<td>0 (0)</td>
<td>2 (1.2)</td>
<td></td>
</tr>
<tr>
<td>Renal Failure n(%)</td>
<td>2 (5.3)</td>
<td>2 (1.2)</td>
<td></td>
</tr>
<tr>
<td>Myocardial Infarction n(%)</td>
<td>0 (0)</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Anastomotic Complications n(%)</strong></td>
<td></td>
<td></td>
<td>*0.011</td>
</tr>
<tr>
<td>Anastomotic Leak n(%)</td>
<td>3 (7.9)</td>
<td>9 (5.3)</td>
<td>0.226</td>
</tr>
<tr>
<td>Cutaneous Fistula n(%)</td>
<td>0 (0)</td>
<td>3 (1.8)</td>
<td>0.542</td>
</tr>
<tr>
<td>Ischemic Conduit n(%)</td>
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<td>4 (2.4)</td>
<td>0.441</td>
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<tr>
<td>Staged Procedure/Discontinuity n(%)</td>
<td>1 (2.6)</td>
<td>6 (3.6)</td>
<td>0.385</td>
</tr>
<tr>
<td>Stricture n(%)</td>
<td>2 (5.3)</td>
<td>35 (20.7)</td>
<td>*0.025</td>
</tr>
<tr>
<td><strong>Number of Dilations mean [range]</strong></td>
<td>2.5 [1-4]</td>
<td>3.3 [1-12]</td>
<td>0.714</td>
</tr>
</tbody>
</table>

*Statistically significant value (p<0.05)
<table>
<thead>
<tr>
<th></th>
<th>Overall Morbidity</th>
<th>Stricture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes = 109</td>
<td>No = 98</td>
</tr>
<tr>
<td><strong>Gender (Male) n(%)</strong></td>
<td>94 (86.2)</td>
<td>74 (75.5)</td>
</tr>
<tr>
<td></td>
<td>*0.049 *</td>
<td>1</td>
</tr>
<tr>
<td><strong>Age mean (SD)</strong></td>
<td>67.3 (8.7)</td>
<td>62.3 (10.1)</td>
</tr>
<tr>
<td></td>
<td>*&lt;0.001 *</td>
<td>1</td>
</tr>
<tr>
<td><strong>Tobacco Use n(%)</strong></td>
<td>82 (75.2)</td>
<td>64 (65.3)</td>
</tr>
<tr>
<td></td>
<td>0.118</td>
<td>1</td>
</tr>
<tr>
<td><strong>BMI mean (SD)</strong></td>
<td>27.3 (5.1)</td>
<td>26.5 (5.1)</td>
</tr>
<tr>
<td></td>
<td>0.317</td>
<td>1</td>
</tr>
<tr>
<td><strong>Diabetes n(%)</strong></td>
<td>27 (24.8)</td>
<td>13 (13.3)</td>
</tr>
<tr>
<td></td>
<td>*0.036 *</td>
<td>1</td>
</tr>
<tr>
<td><strong>Vascular Disease n(%)</strong></td>
<td>15 (13.8)</td>
<td>7 (7.1)</td>
</tr>
<tr>
<td></td>
<td>0.123</td>
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</tr>
<tr>
<td><strong>Charlson Comorbidity Index mean (SD)</strong></td>
<td>5.2 (1.7)</td>
<td>4.2 (1.9)</td>
</tr>
<tr>
<td></td>
<td>*&lt;0.001 *</td>
<td>1</td>
</tr>
<tr>
<td><strong>Neoadjuvant Therapy n(%)</strong></td>
<td>89 (81.7)</td>
<td>67 (68.4)</td>
</tr>
<tr>
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<td>0.301</td>
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<tr>
<td><strong>Chemotherapy n(%)</strong></td>
<td>90 (82.6)</td>
<td>67 (68.4)</td>
</tr>
<tr>
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<td><strong>Anastomosis Type</strong></td>
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</tr>
<tr>
<td><strong>Stapled n(%)</strong></td>
<td>105 (96.3)</td>
<td>88 (89.8)</td>
</tr>
<tr>
<td></td>
<td>0.792</td>
<td>1</td>
</tr>
<tr>
<td><strong>Hand Sewn n(%)</strong></td>
<td>4 (3.7)</td>
<td>9 (9.2)</td>
</tr>
<tr>
<td></td>
<td>0.310</td>
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</tr>
<tr>
<td><strong>Discontinuity n(%)</strong></td>
<td>0 (0)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td><strong>Anastomosis Location</strong></td>
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<td>0.876</td>
</tr>
<tr>
<td><strong>Chest n(%)</strong></td>
<td>10 (9.2)</td>
<td>5 (5.1)</td>
</tr>
<tr>
<td></td>
<td>3 (8.1)</td>
<td>12 (7.1)</td>
</tr>
<tr>
<td><strong>Neck n(%)</strong></td>
<td>99 (90.8)</td>
<td>92 (93.9)</td>
</tr>
<tr>
<td></td>
<td>34 (91.9)</td>
<td>157 (92.4)</td>
</tr>
<tr>
<td><strong>Discontinuity n(%)</strong></td>
<td>0 (0)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td><strong>Surgical Approach</strong></td>
<td></td>
<td>*0.032</td>
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<tr>
<td><strong>Minimally Invasive n(%)</strong></td>
<td>100 (91.7)</td>
<td>96 (98.0)</td>
</tr>
<tr>
<td></td>
<td>34 (91.9)</td>
<td>162 (95.3)</td>
</tr>
<tr>
<td><strong>Open n(%)</strong></td>
<td>9 (8.3)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td></td>
<td>3 (8.1)</td>
<td>7 (4.1)</td>
</tr>
<tr>
<td><strong>Hybrid n(%)</strong></td>
<td>0 (0)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td></td>
<td>0 (0)</td>
<td>1 (0.6)</td>
</tr>
</tbody>
</table>

* Statistically significant value (p<0.05); BMI - Body Mass Index
TABLE CAPTIONS

- **Table 1.** Demographic and Preoperative Data
- **Table 2.** Operative Data
- **Table 3.** Overall Morbidity and Anastomotic Complications
- **Table 4.** Bivariate Analysis for Overall Morbidity and Stricture