

## How to write a Scientific Article for a Medical Journal

Dr S.S.Harsoor, Bangalore Medical College & Research Institute, Bangalore  
Formerly- Editor Indian Journal of Anaesthesia

Scientific format of writing has a rigid structure because it is a method of efficiently communicating scientific research to other scientists in a uniform manner. Uniformity is essential because

- Some readers use titles to search the information.
- Few desire to use only abstract their purpose.
- Other may be willing to go deep into results and discussion.

An article should benefit all types of readers. Scientific research is a tool to get both old and new ideas tested, so as to guard against stagnation, and finally it must be applied into day to day medical practice. Not all who look at a journal are going to read, sometimes not even one article in it. Therefore, the Writers must know what turns looker into a reader. (JW Howie 1976.)

Thus a scientific article helps in translating the results of research work to be read by beneficiaries, with ultimate aim of benefiting mankind and suffering patients. Writing an article is like final examination, where author desires to express his outcome and expects an appreciation and recognition. The result can be a mere pass or even a distinction.

A medical scientific article also benefits a fellow researcher to study a step further. Hence a standard format of research is absolutely necessary. Presently “publications” in national, international and indexed journal has become a yardstick of an academician’s standing in the specialty.

Writing an article includes what contents to be written and how it should be written. But the basic foundations of an article constitute: A research study which is properly planned, designed and conducted and it must begin at level of conception of study itself. Identify the contemporary knowledge gaps and plan to fill them. An already published and accepted may not be a welcome article.

### I. HOW TO WRITE:

1. Before writing to a particular journal, please read the set of “Instructions to Authors” published by the respective editorial board. Follow the particular set pattern with regard to format, style and content

2. The writing must always have precision, clarity and economy of words.

3. Pay attention to the order and organization of the information you wish to communicate to the readers.

4. While writing, it must be presumed that an ordinary reader has atleast the same level of knowledge and expertise base, as you are having.

5. Prose: Always write complete sentences and easily understandable language using correct grammar and spellings. Write clearly and concisely so that every paragraph conveys a particular message and meaning. A poetic language and flowery prose will not impress the readers of scientific journal. Reviewers always look for the clarity, brevity and validity of sentences.

6. Appropriate and consistent use of specific words convey lot of messages with few words, but never use words, which many people have never heard of. Never use colloquial or slang language.

7. Abbreviation should not be used all the times when writing a text, except for few units eg. 57° C, 98.4° F, 45mm. 10.4Kgs etc. Use of units like 40 minutes, 18 years during the text format is preferred..

8. Since the research articles reflect the work which is already completed, use past tense throughout the paper.

9. Many specialties and journals adhere to the use of third person constructions and the first person to be used sparingly e.g. We (I) conducted this study....

10. Use of active words improves clarity and the message is sent effectively. The terminology used should be uniform throughout the paper. e.g. Oxygen requirement by the myocardium is increased, or Myocardial oxygen demand is increased

11. References: The information and results obtained from other authors & articles must be restated in your own words and you must provide a citation without fail. Plagiarism or using others words, ideas and findings as your own, must be strongly discouraged and it is a criminal offence.

12. All the direct and indirect help in the study may be acknowledged.

## II. WHAT TO WRITE

**Writing:** Almost all the scientific publications across the globe since 1950, widely accept the **IMRAD** structure for writing the articles

**Introduction:** What is the problem, why we started,

**Materials and methods:** What we do and how we solved the problem

**Results:** What we found out. &

**Analysis**

**Discussion;** What does it mean

**Submission:** The manuscript must be submitted in the **TAKAR** format

**Title:** description of the content of the article.

**Abstract:** what we did

**Key words:** As used in MeSH (medical subject headings)

**Acknowledgement:** who helped me?

**References;** whose wrote did I refer

Follow the uniform requirements for manuscripts submitted to the bio medical journals, as recommended in 1974, by international committee of medical journal editors.[ICMJE], For further details please refer to [www.icmje.org](http://www.icmje.org)

1. **TITLE:** The title of the articles should describe the contents of the article; and must contain key words, so that electronic database can detect your article. If possible title should also provide the key results of the study. A Poor title can be e.g. “Use of Fentanyl for post operative analgesia”, which can be rewritten as “Intrathecal low dose Fentanyl added to Local Anaesthetic prolongs postoperative analgesia”.

2. **AUTHORS:** The designation, qualifications, institutional affiliation and correspondence address and e-mail address of author to be provided always. Additional information such as telephone numbers also welcome. The number of authors should not

exceed the permitted limit such as, four or six as limited by the particular journal for the type of article.

**3. ABSTRACTS AND KEYWORDS:** The abstract must contain major aspects of the study in one paragraph in 150-250 words. It should clearly mention the purpose and the need for the study. Few journals insist on structured abstract for all original articles or clinical investigations, but the same may not be applicable for case reports or correspondences. It should include Background, Aims, Settings and Design, Methods and Material, Statistical analysis used, Results and Conclusions, without using any abbreviations, figures, tables or references.

Always mention about 3-10 key words which are listed from MeSH terms provided by National Library of Medicine. This will help the search engines to locate your article easily.

**4. INTRODUCTION (Including Review of Literature):** Introduction should clearly lay down the purpose of the study with very brief review of literature, citing the definite need of the present study. It should highlight the research question in the context of existing gaps in the knowledge and our current understanding of problem. It should also mention how this study will advance our clinical knowledge. We must focus our attention on 4-5 pertinent original latest research articles and recently published review articles rather than reference Text books, because research articles summarize all the research done on a particular subject area over a recent period of time. Don't discuss the techniques or protocols during introduction. But if it is a novel technique or a method never used before, it can be presented in the introduction. For review articles, it is necessary to include the method of literature search in abstract as well as in the introduction section.

**5. MATERIALS AND METHODS:** There are 6 essential components of the material & methods section.

- It should provide study period (duration),
- Is it a retrospective analysis or prospective study,
- Details of inclusion and exclusion criteria,
- How the randomization was done, how you avoided patient selection bias,
- How was masking (blinding) achieved, and how were the controls selected
- Power analysis and how the sample size was determined.

Statistical Analysis should be one of the headings in material and methods section. This section must describe the demography of individuals chosen for the study such as age, gender, weight, the drugs used and their dose, route and timing of administration. Any subjective parameters, e.g. Sedation scores or pain scores, should be described with appropriate references. It is preferable to mention the setting in which study was carried out, so that other can apply these observations and study them in their setup. But the identity of our patients should not be disclosed at any level. Always mention the details of ethical clearance from local review board and informed consent from patients/control. Do not include the names of the institutions or any other such information which can reveal the identity of the contributors, as this will hinder the unbiased peer review process.

**6. RESULTS:** In the section all the patients must be accounted for and the actual results must be presented without any interpretations and opinions. Even the important negative or unexpected results should be reported. Note that the outcome of statistical

analysis is not a key result but rather an analytical tool that helps us to understand the results. The tables and figures should be arranged in logical sequences. Do not present the same tables as Charts or graphs again. Try to limit the number of tables & charts as per the journal specifications. Conventionally one table or figure is allowed per 500-600 words. The table legends must be described on the top of the table and figure legends at the bottom of the figures. The statistical test summaries are reported in parenthesis along with clinical results .e.g. “The results of postoperative analgesia in group B [178.5±21min, n=100] was shorter than the group BF [347±74.5min, n=100] in the elective C-Section patients studied...” Always use the appropriate units of measurements, and abbreviations should be used with only data and not in the text description [except the approved abbreviations e.g. °C or ° F ]. These units should be placed after the error value e.g. 110±9.8mm Hg [not 110mm Hg ± 9.8]. When a series of numbers are used, then unit should be placed after the last number 2, 4, 6, 8 and 10 min and not as 2min, 4min, 6min, 8min and 10 min].

### 7. DISCUSSION AND CONCLUSION:

Here the observed data are interpreted in the light of already known information. It should contain following messages

- (a) Summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis);
- (b) Interpretation and implications in the context of available evidence such as a systematic review or metaanalysis, what this study adds to the available evidence, effects on patient care and health policy, and what are the possible mechanisms.
- (c) Controversies raised by this study
- (d) Strengths and limitations of the study; and
- (e) Future research directions.

Do not introduce new results here, without being presented earlier in the materials and methods, and results. The conclusions and recommendations made should not go beyond the limits of the study and results should not be generalized for all the patient population.

8. **ACKNOWLEDGMENTS:** Any significant help received in thinking, designing or conducting the work or received in the form of material logistics may be acknowledged.

9. **REFERENCES:** It is not true that a very long list of references increases the validity of article. The references must be used and listed in Vancouver style which is an universal practice. It is always preferable to use newer references published in the last 5-6 years, unless older references have a significant impact on your study. Before submitting the manuscript, once again check the accuracy of references cited in the manuscript as editorial board can ask the contributors to submit photocopies of the first pages of the references. Do not attempt to use abstracts as references.

For additional details and for exact style of citing references please refer to [http://www.nlm.nih.gov/bsd/uniform\\_requirements.html](http://www.nlm.nih.gov/bsd/uniform_requirements.html)

- a. Always list the first six contributors and if the number of authors exceeds six, then only use the word - et al.
- b. Do not include unnecessary bibliographic elements such as month or brackets. Follow the punctuation marks carefully.
- c. Provide correct abbreviations for journal titles, eg. Indian J anaesth

- d. Follow the correct order of citing bibliographic elements.
- e. Do not use italics for the journal title,
- f. For references from books, all the bibliographic elements should be included.

The Bibliography is a reference which you may not have used and it is relevant only in cases of Book writing or you advise others to read.

It is essential to send the contributors' form signed by all the authors and copyright transfer form as prescribed by the journal along with the article as the article will become the property of the particular editorial board. Any delay in submission may even delay the Review process. Always limit the number of words for both the abstract as well as manuscript as per the journal requirements.

Finally, your study should be reproducible by any other researcher working in a similar clinical setup and the manuscript should convert a looker into a reader.

**Suggested reading:**

1. Writing scientific papers in English by O'connor, M Woodford
2. How to write a scientific article for a medical journal?. by PF Kotur, in IJA 2002

Note: This information is primarily relevant for the preparation of manuscript for Research articles (Randomized controlled trials). The format for publication of Systematic Review articles or Meta analysis and for the Case reports varies from this, though the basic principles remain the same.