How to...
write a scientific paper

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Belgium

“Good scientific writing is not a matter of life or death… it is much more serious than that”

R Day in “How to write & publish a scientific paper”
Vegetative state

- O88 Mon 14:15 Room E
  Measuring intentional mental imagery – and hence consciousness - in non-communicative brain injured patients using fMRI

- O163 Tue 14:00 Room E
  Changes in cerebral metabolism in patients emerging from the minimally conscious state

- O183 Tue 16:15 Room B
  Better use a mirror to evaluate eye tracking in post-comatose states

- O187 Tue 17:00 Room B
  Transitory vegetative state at the intensive care unit: does it exist?

- P269 Mon 11:30-13:00
  Misdiagnosis of the vegetative and minimally conscious state
What?

Without publication, science is dead

Gerard Piel
A primary publication is

- The first publication of original research results
- In a form whereby peers of the author can repeat the experiments and test the conclusions
- In a journal or other source document readily available within the scientific community
A naturalist’s life would be a happy one . . . if he had only to observe and never to write

Charles Darwin
Criticism and testing are of the essence of our work. This means that science is a fundamentally social activity, which implies that it depends on good communication.

In the practice of science we are aware of this, and that is why it is right for our journals to insist on clarity and intelligibility...

Hermann Brodi
Nothing is done till the paperwork is done

A scientific experiment, no matter how spectacular the results, is not completed until the results are published.

New data must be authenticated and added to the existing database that we call scientific knowledge.

Reproducibility

Scientists are measured, and become known (or remain unknown) by their publications.
How?

For what good science tries to eliminate,
good art seeks to provoke – mystery,
which is lethal to the one,
and vital to the other

John Fowles
How should we write?

- First “do” good science
  next “write” good science

- Bad writing can and often does delay or prevent publication

- There is no single best way to prepare a scientific manuscript

- Basic principles
What | Why | How

How to ... run a marathon
How do you get to Carnegie Hall?
How do you get to Carnegie Hall?

Practice, practice, practice
How do you write a paper?

Practice, practice, practice
Overview

Effective outline
First draft
Materials & methods
Results
Discussion
Introduction
Abstract & title
Outline

Don’t start vast projects
with half-vast ideas

managing editors’ creed
How to make an effective outline

• notes to guide your thinking
• architectural blueprint
• organize topics & arguments in logical form
• divide the expedition in # smaller tasks

adapted from San Francisco Edit
Welcome

We specialize in editing and proofreading manuscripts for submission to peer reviewed journals. A high percentage of the papers we have edited have been successfully published, and many were accepted by the journal initially targeted by the author.

Why Have Your Manuscript Professionally Edited?

It increases your chances of being published.

"There is a clear indication that badly written articles correlate with a high rejection rate."

"On equal scientific merit, a badly written article will have less chance of being accepted."

R. Coutas, B. Stargson, J. Boharman, and E. Parini Cardiovascular Research, February 2002

"Factors that caused most problems were poor use of English and careless preparation of the manuscript."


Fast Completion:

We usually complete the editing of a manuscript in 6-8 days from the acceptance of the quote; 3-4 days for rush jobs.
Effective outline

1. Develop a central message
2. Define the materials and methods
3. Summarize the question(s) and problem(s)
4. Define the principal findings and results
5. Describe the conclusions and implications
6. Organize and group related ideas together
7. Identify references pertaining to key points
8. Target a journal
9. Identify co-authors
10. Seek advice
1. Develop a central message!!!

- What it is that you want your readers to understand about your work
  1. Describe your work to a colleague in one minute
  2. Summarize your paper in one (two) sentence(s)
  3. Write down the three central points of your paper

- Everything in the manuscript will be written to support this central message
2. Define the materials and methods

- Briefly state the population, sampling method & materials you used,

and most importantly, the methods you used
3. Summarize the question(s) & problem(s)
   - What was known before?
   - Answers needed to address the problem(s)?
   - **Key points** pertaining to question(s)
   - What did you do to answer the question(s)?
Effective outline

4. Principal findings and results

- principal findings = central message
- other findings you will report most support or fit in context “LEITMOTIF”
- visualize your principal findings table(s), graph(s), figure(s)
5. Describe the conclusions & implications

- What is new in your work and why does it matter?
- What are the limitations and the implications of your results?
- Are there any changes in practice, approaches or techniques that you would recommend?
Effective outline

6. Organize & group related ideas together

- organizing scheme should be clear and well structured:
  numbering, scheme, issue tree, cluster map...
7. Identify the references

- for each key point write down (and know) the main references
Effective outline

8. Target a journal

- journal’s impact factor
- journal’s focus
- examine recent issues
- examine related papers to your topic
Impact factor
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<th>ISSN</th>
<th>Total Cites</th>
<th>Impact Factor</th>
<th>Immediacy Index</th>
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Impact factor

Journal Citation Reports

Journal Title: ANNALS OF NEUROLOGY

Mark | Journal Title | ISSN | Total Cites | Impact Factor | Immediacy Index | Articles | Cited Half-life | Citing Half-life
-----|---------------|------|-------------|---------------|----------------|---------|----------------|------------------
      | ANN NEUROL    | 0364-5134 | 24933       | 7.571         | 1.243          | 251     | 7.8            | 5.6

Journal Information

Full Journal Title: ANNALS OF NEUROLOGY
JCR Abbrev. Title: ANN NEUROL
ISSN: 0364-5134
Issues/Year: 12
Language: ENGLISH
Journal Country/Territory: UNITED STATES
Publisher: WILEY-LISS
Publisher Address: DIV JOHN WILEY & SONS INC, 111 RIVER ST, HOBOKEN, NJ 07030
Subject Categories: CLINICAL NEUROLOGY, NEUROSCIENCES

Journal Impact Factor
Impact factor

**Journal Impact Factor**

Cites in 2005 to articles published in 2004 = 1574
Number of articles published in 2004 = 237
2003 = 2051
2002 = 2855
2001 = 3725
2000 = 492
Sum: 3725
Sum: 492
Calculation: Cites to recent articles / Number of recent articles = 7.571

**Journal Immediacy Index**

Cites in 2005 to articles published in 2005 = 312
Number of articles published in 2005 = 251
Calculation: Cites to current articles / Number of current articles = 1.243

**Journal Cited Half-Life**

The cited half-life for the journal is the median age of its articles cited in the current JCR year. Half of the citations to the journal are to articles published within the cited half-life.

**Cited Half-Life: 7.8 years**

Breakdown of the citations to the journal by the cumulative percent of 2005 cites to articles published in the following years:

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<td>1574</td>
<td>2051</td>
<td>1855</td>
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<td>1723</td>
<td>1478</td>
<td>1260</td>
<td>1102</td>
<td>9750</td>
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<td>Cumulative %</td>
<td>1.25</td>
<td>7.97</td>
<td>16.19</td>
<td>23.03</td>
<td>30.77</td>
<td>38.58</td>
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<td>51.42</td>
<td>56.48</td>
<td>60.90</td>
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**Cited Half-Life Calculations**

The cited half-life calculation finds the number of publication years from the current JCR year that account for 50% of citations received by the journal. Read help for more information on the calculation.

**Cited Journal Graph**

Click here for Cited Journal data table.

This graph shows the distribution by cited year of citations to articles published in the journal ANN NEUROL.
Impact factor

The journal impact factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The impact factor will help you evaluate a journal's relative importance, especially when you compare it to others in the same field. For more bibliometric data and information on this and other journal titles click on the "Return to Journal" button.

NOTE: Title changes and coverage changes may result in no impact factor for one or more years in the above graph.
9. Define co-authors

- avoids trouble & dispute later on
- last author
- corresponding author
- acknowledgements
Effective outline

10. Seek advice

- read your outline the next day
- discuss it with co-authors
- discuss it with non-initiated
- discuss it with your supervisor
- make requested changes (or start over)
- read references you missed
- now start first draft
First discuss your outline
First draft

State your facts as simply as possible, even boldly, no one wants flowers of eloquence or literary ornament in a research article

R.B. McKerrow
Instructions and Information Sheets

Authors submitting a manuscript to the Journal of Neurology are required to follow the guidelines below. Please be aware of the below given information on copyright matters.

- **Instructions for Authors**
- **Technical Instructions**
- **Copyright Information**
Journal of Neurology

Official Journal of the European Neurological Society

The Journal of Neurology is an international journal which officially represents the European Neurological Society and provides a source for publishing original communications on clinical neurology and related basic research.

Commentaries on new developments in clinical neurosciences, which may be commissioned or submitted, are published as editorials. Letters to the Editors serve as a forum for the exchange of ideas or clinical notes and provide an opportunity for commenting on published papers. News sections provide information on the development of neurological medi

INSTRUCTIONS FOR MANUSCRIPT SUBMISSION

Manuscript submission

Manuscripts need to be submitted electronically by means of upload to the journal’s manuscript submission site
http://mc.manuscriptcentral.com/jneuro

Abstract and Keywords

An abstract containing the essential points must accompany each article. It should be written to present a condensed extract of the article and be suitable for international documentation systems. An inadequate abstract delays the processing of the manuscripts. Up to 5 keywords needed for a register and for documentation purposes are to be given below the abstract.

References

Only articles cited in the text are to be listed. They should be arranged alphabetically by the first author's name and numbered sequentially. Only the reference number should appear in the text (in parentheses).

Articles in journals:


Books:

Effective first draft

1. Consolidate all the information
2. Start writing, in parts, in superman-mode
3. Write quickly & without editing
4. Write in your own voice
5. ABC... Accuracy, Brevity & Clarity
6. Put aside for a day than revise, re-revise
7. Be consistent in style
Effective first draft

1. Consolidate all the information

- Ensure you have everything you need to write efficiently, i.e., all data, references, drafts of tables and figures, etc.
- Convert your approved outline and notes into narrative form
- Tell your story, take the reader by the hand
Effective first draft

2. Start writing, in parts, in superman-mode
   - Put something down
     - main points & ideas
     - keep to the plan of your outline
2. Start writing, in parts, in superman-mode
   - Write in parts
     - start with the easiest: methods, results
     - discussion, conclusion, introduction, abstract, title
   - Write when energy is high, not when tired
   - Find time & place where you can think & write without distractions
Effective first draft

3. Write quickly & without editing
   - First, don’t lose time with details (words, grammar, punctuation...)
   - Don’t try to write and edit at the same time
   - Keep the flow, don’t get stuck

4. Write in your own voice
   - Easier to follow for the reader ...
     but hard for non-native-English speaker
Effective first draft

5. ABC... Accuracy, Brevity & Clarity

- avoid unnecessary words
- ideal sentences: 15-20 word
- ideal paragraphs: 150 words
Effective first draft

6. Put aside for a day than revise, re-revise

- Revise and re-revise till you feel it is not possible to improve it further

- Look at your paper not as its author but as a reviewer
Effective first draft

7. Be consistent in style
   - Revise for coherent style
   if co-authors write their part
Material & methods

The greatest invention of the 19th century was the invention of the method of invention

AN Whitehead
A brief history of scientific writing

- First scientific journals
  - Initially descriptive
  - 1665 *Journal des Sçavants*
  - 1665 *Philosophical Transactions of the Royal Society of London*
- Pasteur versus spontaneous generation
  - Describe experiments in great detail
  - Reproducibility of experiments
- American National Standards Institute 1972 : IMRAD
  - What question/problem was studied ? = INTRODUCTION
  - How was the problem studied ? = METHODS
  - What were the findings ? = RESULTS
  - What do these findings mean ? = DISCUSSION
Material & methods

• Purpose:
  Explain clearly how you conducted your study
  ➢ enable readers to evaluate the work performed
  ➢ permit others to replicate your study

• Review the journal’s guidelines

• Balance between brevity (don’t include irrelevant information) and completeness
Material & methods

• Don't mix results with procedures
• Omit all explanatory information and background - save it for the discussion
• Approval by ethics committee & informed consent
• Describe statistical tests & comparisons made
• Identify source equipment, enzyme, culture
Material & methods

• Order procedures chronologically or by type of procedure

• Use the past tense and the third person
  “The patients were studied free of sedative drugs.”
  NOT: “I studied the patients free of sedative drugs”

• Avoid ambiguous naming
  "healthy volunteers" versus “vegetative patients”
  NOT: "group 1" versus “group 2”

• Show to a colleague
  Would she/he be able to repeat the study?
Results

Results!
Why, man, I have gotten a lot of results.
I know several thousand things that don’t work

Thomas A Edison
Results

• Purpose = present key results
  • not all results obtained need reported
  • results relevant to the question(s) presented in introduction
  • irrespective of whether or not the results support the hypothesis(es)
  • no interpretation of their meaning, no discussion

• Order
  • from most to least important
  • as in methods (for every result there must be a method)
  • chronological

• Sequence of data, tables & figures
  must tell your story

• Use the past tense
Results

• **Data in text, figures, graphs OR tables ?**
  - verify accuracy & consistency of data throughout paper
  - do not repeat the same information
  - describe magnitude of response or difference (if appropriate %)
  - number figures & tables consecutively as mentioned in text
  - mention where to insert figures or tables (“INSERT FIG ABOUT HERE”)
  - provide heading for each figure and table
  - figs & tables come at the end
  - each fig & table must be clear & complete as stand alone

• **Statistics**
  - Summarize analyses
  - report actual P values for all primary analyses
Discussion

Grandiloquence has no place in scientific writing.
Discussion

• **Purpose**
  • State your interpretations & opinions
    • answers posed in introduction
    • literature
  • Explain implications
  • Make suggestions for future research (no more than two)

• **Heart of the paper, usually requires several attempts**

• **No paper is perfect**

• **Write in present tense**
Discussion

- No reiteration of results but commentary
- No side issues (they obscure your message)

- Organize from the specific to the general
  - your findings to the literature, to theory, to practice

- Organization!
  - use outline and follow logical form

- As short as possible
  - discuss everything, but be concise, brief, and specific
  - clearly and fully state, support, explain, and defend your answers
  - only discuss important and directly relevant issues
• First re-state your hypothesis

• Discuss how results answer questions from introduction (use same key terms & order)

• Discuss how answers fit in existing literature
  • Describe each major result
  • First state answer, then relevant results, then cite others
  • Make figure to enhance your “story”
  • Always clearly separate facts from speculation

• Defend your interpretation
  • explain why your answer is satisfactory and why others are not
  • give both sides to the argument
  • discuss and evaluate conflicting explanations of the results
Discussion

• Unexpected findings
  • report the finding and then describe it

• Potential limitations and weaknesses
  • comment on relative importance of these to your interpretation & validity
  • avoid using an apologetic tone

• Explain
  • how results & conclusions are important
  • how they influence our knowledge or understanding of the problem
Introduction

A bad beginning makes a bad ending

Euripides
Introduction

• **Purpose**
  • stimulate the reader’s interest
  • summarize the problem to be addressed
  • discuss previous research on the topic
  • give background information necessary to understand the rest
  • explain exactly what the paper will address, why, and how

• Motivate the reader to read on & care about results
• Motivate journal’s reviewers and editors

• Some write this first, others after everything else
Introduction

• First, provide a concise **background** account of the problem studied

• **Aim** of the study!

• Establish **significance**
  • Why was there a need to conduct the study?

• Introduce pertinent **literature**
  • Outline big picture
  • Do not give a full history of the topic
  • Only previous work with directly related to problem

• Clearly state **hypothesis**, variables investigated, concisely summarize methods used
Introduction

• Outline your major findings & explain how they contribute to the larger field of research

• State principal conclusions (depend on journal)

• Identify questions left unanswered and new questions generated
Introduction

- Know & adapt to your audience
- Move from general to specific
  - from the problem in the real world to the literature to your research
- Write in the present tense except for what you did or found (=past tense)
- Be very concise & well structured
  - usually 300 to 500 words
  - information needed to follow the development of your findings
- Define abbreviations or specialized terms
Abstract & title

First impressions are strong impressions
Abstract

• **Purpose**
  • highlight your major points
  • concisely describe content and scope
  • review material in abbreviated form

• Check "Guidelines for Authors" - IMRD format?

• Summarizes, condenses, your whole paper

• Provide as much new information as possible

• Give the abstract to a colleague (unfamiliar with your work) and ask whether it makes sense
Title

- Purpose
  - Describe the contents of the paper in the fewest possible words

- Will be read by thousands (perhaps few people, if any, will read the entire paper)

- Avoid waste words (useless for indexing)
- Avoid abbreviations

- Check syntax (word order)
Referencing & bibliography

EndNote

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* Mac version releases in August

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Ethics

Science does not select or mold specially honest people: it simply places them in a situation where cheating does not pay... For all I know, scientists may lie to the IRS or their spouses just as frequently or infrequently as everybody else.

S. Luria
Ethics

- Originality
- Fraud & cheating
- Dual publication
- Plagiarism
- Copyright
- Authorship
- Embargo
Conclusion

Successful scientific experimentation is the result of a clear mind attacking a clearly stated problem and producing clearly stated conclusions.

R. Day
Use & misuse of English

The best English is that which gives the sense in the fewest short words.
Back-up everything all the time