

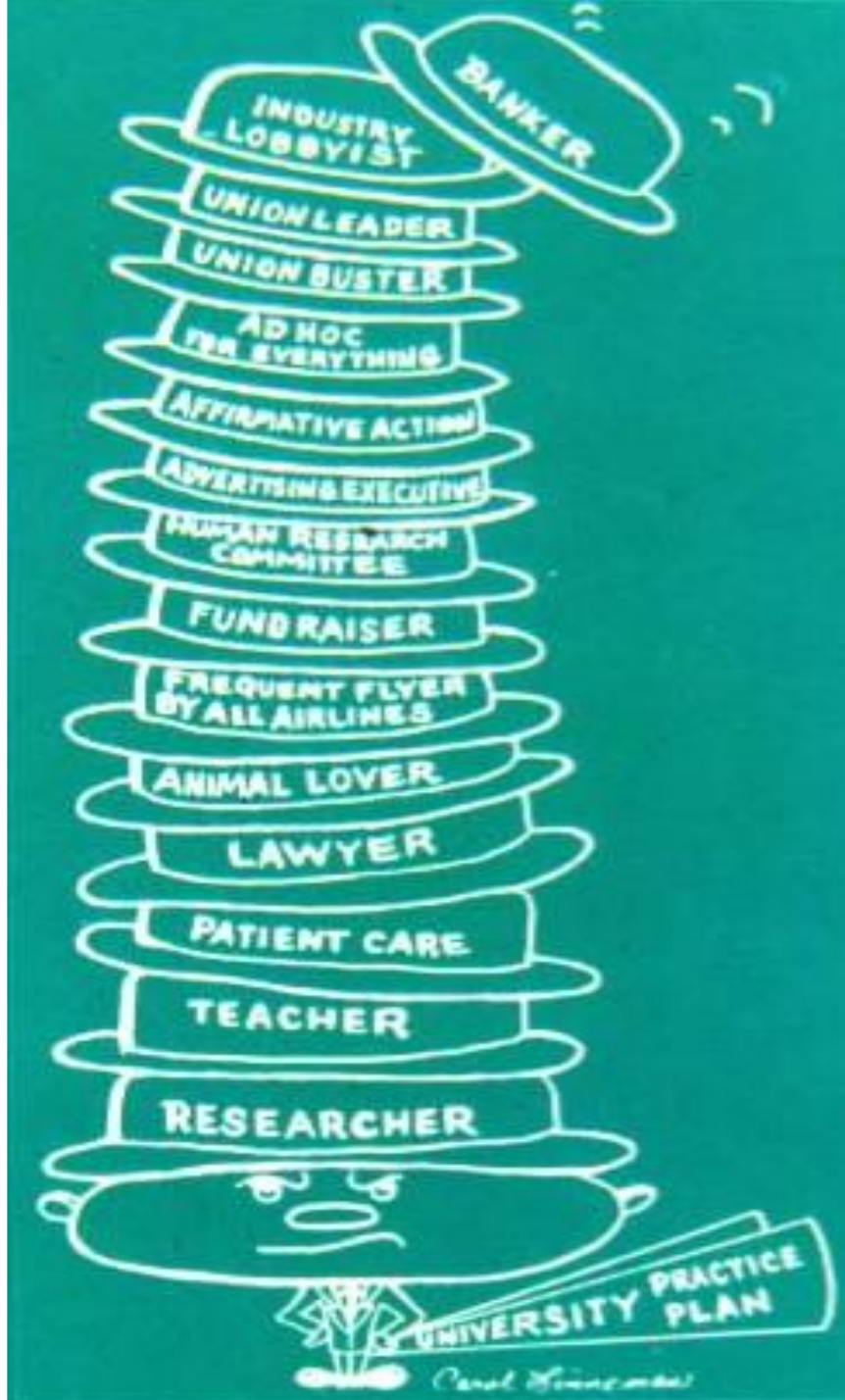
Scientific Writing for Publication

Suthat Fucharoen M.D.

Thalassemia Research Center, Institute of Molecular Biosciences
Mahidol University, Salaya, Nakornpathom, Thailand

(suthat.fuc@mahidol.ac.th)





Criteria for University Ranking

- จำนวนผลงานที่ตีพิมพ์โดยวารสารที่อยู่ในฐานข้อมูลสากล
- จำนวนผลงานที่ได้รับการตีพิมพ์ในวารสาร Nature และ Science
อันเป็นกลุ่มวารสารทางวิทยาศาสตร์ที่จัดได้ว่ามีความ สำคัญ สูงสุด
- จำนวนนักวิจัยที่เป็นเจ้าของผลงานที่ได้รับการอ้างอิงสูงใน สาขาวิชาของตน
- ผลงานที่ได้ต่อจำนวนอาจารย์ที่ทำงานเต็มเวลา
- จำนวนผู้ที่ได้รับรางวัลโนเบลที่ประจำทำงานอยู่

Why should we publish? (1)

(1) การเขียนบทความวิจัยเผยแพร่เป็นการแสดงความรับผิดชอบต่อสังคม

(2) เป็นกิจกรรมที่สร้างความตึกคักให้แก่ประชาคมวิจัย เกิดการแลกเปลี่ยนความรู้เกิดถกเถียงโต้แย้ง นำไปสู่ความงอกงามทางปัญญา

(3) เป็นกิจกรรมที่นำไปสู่มิตรภาพ ทำให้เราได้เพื่อนที่เป็นนักวิจัยในสาขาเดียวกันที่อ่านบทความของเรา และเขียนจดหมายมาขอรีพริ้นท์ หรืออีเมลมาแลกเปลี่ยนความเห็น อาจนำไปสู่ความเป็นมิตรที่ใกล้ชิดยิ่งขึ้นคือร่วมมือกันทำวิจัย

Why should we publish? (2)

(4) เป็นการเรียนรู้ในรูปแบบหนึ่ง เป็นการฝึกฝนตนเองทั้งในด้านสมาธิ ให้มีใจจดจ่ออยู่กับเรื่องเดียวในระยะเวลาหนึ่ง ฝึกพลังสมองและทำให้ไม่ล่าช้าหลังทางวิชาการ

(5) เป็นการสร้างความยอมรับและชื่อเสียงในประชาคมวิจัย

(6) เป็นการฝึกควบคุมอารมณ์ โดยเฉพาะเมื่อโดน **reviewer** ต่ำหนักมาแรง ๆ

(7) เป็นการฝึกภาษา ถ้อยคำการทำรูปภาพ ทำตาราง เขียนคำอธิบาย เป็นต้น

Why should we publish? (3)

(8) คนที่เคยเขียนบทความวิจัย จะเรียนรู้จากการอ่าน
บทความวิจัยของผู้อื่นได้ดีขึ้น มากขึ้นและลึกซึ้งขึ้น
สามารถอ่านหรือมองเห็นได้หลายมิติ ในลักษณะที่เห็นสิ่ง
ที่ซ่อนหรือแฝงอยู่ “ระหว่างบรรทัด” หรือ “ระหว่างหน้า”
ของวารสาร เกิดความเข้าใจชุมชนวิจัยในสาขา หรือ
ประเด็นนั้น เกิดความเข้าใจในสถาบันวิจัย วัฒนธรรมวิจัย
ประเด็นวิจัยที่เป็นยอดฮิตแห่งยุคสมัย
ประเด็นที่เป็นข้อถกเถียงโต้แย้ง รวมความว่าใน การเขียน
บทความ วิจัยออกเผยแพร่ ผู้เขียนได้รับประโยชน์มากกว่า
การมีผลงานตีพิมพ์หลายเท่า ในลักษณะของ
“ประโยชน์ที่จับต้องไม่ได้”

Publish or Perish

‘Publishing is the chief currency in this universe, the main source of validation of one’s research, and often the key indicator of academic success. Promotion and tenure committees value peer-reviewed publications above all;... that is, regrettably, even above clinical performance or community service.’

Open access anxiety in the publish or perish world blogged by Jacalyn Clark

Background: Author's Perspective

Motivation to publish:

- Dissemination (54% 1st choice)
- Career prospects (20% 1st choice)
- Improved funding (13% 1st choice)
- Ego (9% 1st choice)
- Patent protection (4% 1st choice)
- Other (5% 1st choice)

Bryan Coles (ed.) The STM Information System in the UK, BL Report 6123, Royal Society, BL, ALPSP, 1993

Author versus Reader Behavior

- Author behavior

- Want to publish more
- Peer review essential
- Other journal functions crucial
- Wider dissemination

- Reader behavior

- Want integrated system
- Browsing is crucial
- Quality information important
- Want to read less

Elsevier study of 36,000 authors (1999-2002) presented by Michael Mabe at ALPSP Seminar on “Learning from users” 2003; www.alpsp.org

Good Journal

วารสารที่มีคุณภาพ

1. เป็นวารสารของส่วนกลาง Nature, Science
2. มีเนื้อหาสาระที่ดี
3. มีการออกตามกำหนดที่แน่นอน
4. มีรายละเอียดด้านบรรณานุกรม (bibliographic details)
5. มีผู้อ้างอิงบทความจำนวนมาก (Impact Factor)
6. ได้รับการครอบคลุมโดยวารสารทุติยภูมิ (Abstracts, Indexes)

How to Write and Publish Papers in the Medical Sciences

Edward J. Huth M.D.
Editor, Annals of Internal Medicine

ISI Press
Philadelphia

Blackwell Science - Best Practice Guidelines on Publishing Ethics

<http://www.blackwellpublishing.com/Publicationethics/>

<http://www.icmje.org/>

WRITING IS HARD WORK

Why write a paper if it is not going to get published?

The probability that a paper with a clear message will emerge from research is determined more by how the research was conceived and planned than by how well the paper is written.

Part I: Publication & Peer Review

Deciding to Publish and Submitting Your Paper

Is the paper worth writing?

What to publish? What do I have to say?

abstract vs. full report

Choosing your forum

Which type of journal is best for you?

What audience are you targeting?

Research the journal

Publication guidelines

Article style

What do I have to say?

1. Case Report

- case is unique and so uncommon
- it enlarges our concept of disease and our skill in practice

2. Research Paper

- Study properly designed to answer a specific question
- You know what you have to say
- Trying to make a POINT
- Not only to report your experience

3. Review Article

- What questions such a review might answer

Is the Paper Worth Writing?

1. Message is new
2. Expands on or previous published message firm up

Decision to write a paper may depend in part on what you find in a search of the literature.

What makes a good research paper?

- Good science/Arts & Humanities/
Business & management/ Education
- Good writing
- Publication in good journals

What constitutes good RESEARCH?

Novel – new and not resembling something formerly known or used (can be novel but not important)

Mechanistic – testing a hypothesis - determining the fundamental processes involved in or responsible for an action, reaction, or other natural phenomenon

Descriptive – describes how things are but does not test how things work – hypotheses are not tested.

What is the Right Format?

1. Formal report

2. Choose the short format:

concise report, letter to editor, brief

report, clinical notes, short communications

“me-too” paper

What is the Audience?

1. Do not confuse probable audience *vs* audience you feel “needs” the paper
2. What effect will the message have
3. How will it change concept or practice?

So what
Who cares?
Who will care?

What is the Right Journal?

1. Is the topic of my proposed paper within the scope of the journal?
2. Is the topic represented in the journal frequently or only rarely?
3. Would the journal offer the best match of audience and topic?
4. What formats are acceptable to the journal?
5. Does the journal publish an Information-for-Authors page?

What constitutes a good journal?

Impact factor –

average number of times published papers are cited up to two years after publication.

Immediacy Index –

average number of times published papers are cited during year of publication.

Cited half-life –

reflects ongoing use of a particular journal

High-prestige journals also have high rejection rate

Journal Citation 2013/14

Journal	Impact Factor
NEJM	54.42
Lancet	39.21
Science	33.61
Nature	27.36

<http://www.isinet.com>

<http://stang.li.mahidol.ac.th/text/IF.htm>

Things to consider before writing

1. Time to write the paper

- has a significant advancement been made?
- is the hypothesis straightforward?
- did the experiments test the hypothesis?
- are the controls appropriate and sufficient?

2. Tables and figures

- must be clear and concise
- should be self-explanatory

3. Read references

- will help in choosing journal
- better insight into possible reviewers

Things to consider before writing

4. Choose journal

- study “instructions to authors”
- think about possible reviewers
- quality of journal “impact factor”

5. Tentative title and summary

6. Choose authors

TITLE

1. The fewest possible words that adequately indicate the content of the paper (**concise, specific, and informative**)
2. Do not use abbreviation and jargon
3. Should not include **waste** words (studies on, investigation on, a, an, etc)
4. The title should **never** contain abbreviation, acronym, mnemonic or jargon)

Authorship

An author should:

- have generated a part of intellectual content
- collected reported data
- taken part in writing the paper
- be able to defend publicly intellectual content of the paper
- Remember, authorship is not charity

Multiple Publication

From the ethical point of view,
Multiple Publication, not justified by
differing messages or differing audiences
is a menace to the scientific community.
Publication is costly, science can not
afford to waste resources.

(Edward Huth; Editor, Annals of Internal Medicine)

“Salami Science”

Part II: Writing a Scientific/ Research Manuscript



Writing Style and Audience

Checklist:

- Void of anecdotes or stories
- Reports facts not outlandish conclusions
- No misspellings
- Grammatical accuracy
- Meets formatting guidelines
- Avoids using the first person

Who's the audience?

- Write for your target audience

Paper Organization

Abstract: short summary of the study including background information and results

Introduction: nature and scope of the study, review of previous study, method used for study, principle results

Materials and Methods: detailed of subjects and experimental procedure

Results: overall description of the experiment, data presented for the study

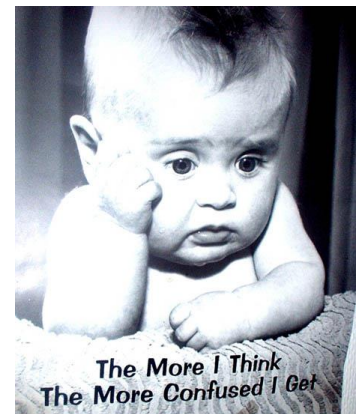
Discussion/Conclusion: evaluation of your data and interpretation of the results

Acknowledgement:

References:

Figures and Tables:

Where Do We Begin?



Abstract

- Why this work was done
- How it was done
- What was found (with statistical evidence)
- What does it mean or why is it important?
- No reference, graph, figure and table
- Define abbreviations at first use, unless considered standard for that journal
- Together, the title and the abstract should stand on their own
- Many authors write the abstract last so that it accurately reflects the content of the paper
- Not to exceed 300 words

Abstract

Common Mistakes

- Too much background or methods information
- Figures or images
- References to other literature, figures or images
- Abbreviations or acronyms

The Structured Abstract: An Essential Tool for Research
http://research.mlanet.org/structured_abstract.html

Introduction

Good introduction include:

- Present scope and nature of the study
- Review the field of study and previous report
- States the method used
- Indicates principle results
- Principle conclusion suggested by the results

(do not include any diagram and equation)

Introduction

Broad information on topic

- Previous research

Narrower background information

- Need for study

Focus of paper

- Hypothesis

Summary of problem (selling point)

Overall 300-500 words

Introduction

- Clearly state the:
 - Problem being investigated
 - Background that explains the problem
 - Reasons for conducting the research
- Summarize relevant research to provide context
- State how your work differs from published work
- Identify the questions you are answering
- Explain what other findings, if any, you are challenging or extending
- Briefly describe the experiment, hypothesis(es), research question(s); general experimental design or method

Methods and Materials

Provides instruction on exactly how to repeat experiment

- Subjects
- Sample preparation techniques
- Sample origins
- Field site description
- Data collection protocol
- Data analysis techniques
- Any computer programs used
- Description of equipment and its use

Methods

- Provide the reader enough details so they can understand and replicate your research
- Explain how you studied the problem, identify the procedures you followed, and order these chronologically where possible
- Explain new methodology in detail; otherwise name the method and cite the previously published work
- Include the frequency of observations, what types of data were recorded, etc.
- Be precise in describing measurements and include errors of measurement or research design limits

Results

Objective presentation of experiment results

- Summary of data

NOT a Discussion!

Common mistakes

- Raw data
- Redundancy
- Discussion and interpretation of data
- No figures or tables
- Methods/materials reported

Results

- Objectively present your findings, and explain what was found
- Show that your new results are contributing to the body of scientific knowledge
- Follow a logical sequence based on the tables and figures presenting the findings to answer the question or hypothesis
- Figures should have a brief description (a legend), providing the reader sufficient information to know how the data were produced

Common Weaknesses in Results

- Inappropriate or incomplete statistics
- Omission of data
- Inconsistent or inaccurate data
- Unclear tables or figures

Graphs

Graphs should include:

- Title
- Axis titles with units
- Adequate tick marks
- Legend
- Description and figure number

Figures and Tables

Tables

- Presents lists of numbers/ text in columns

Figures

- Visual representation of results or illustration of concepts/methods (graphs, images, diagrams, etc.)

FIGURES & TABLES

- Give title to each figure or table
- Each figure and table must be self explanatory
- Should not have many symbols

Discussion

Interpret results

- Did the study confirm/deny the hypothesis?
- If not, did the results provide an alternative hypothesis?
- What interpretation can be made?
- Do results agree with other research? Sources of error/anomalous data?
- Implications how the research has moved the body of scientific knowledge forward
- Do not extend your conclusions beyond what is directly supported by your results - avoid undue speculation
- Suggestions for improvement and future research

Relate to previous research!

Discussion

Common Mistakes

- Combined with Results
- New results discussed
- Broad statements
- Incorrectly discussing inconclusive results
- Ambiguous data sources
- Missing information

Conclusion

What is its message?

Can I put the message into one sentence?

Who will pay attention to that message?

Test its importance with “So-What”.

If it passes the “So-What” test,
ask “important to whom”.

ACKNOWLEDGEMENTS

- ◆ Source of research funding
(this is a MUST)
- ◆ Colleagues, nurse, technician
- ◆ Should not be viewed as a “catch-all”
for anyone you wish to flatter or do not
wish to offend

REFERENCES

Guidelines for producing a useful reference list :

- Restrict the list to those references with a direct bearing on the work described
- Cite only references to journals listed in Index Medicus/ISI/Scopus
- Check the house style on whether the Vancouver or Harvard system is used
- Check the “Instructions to authors” to make sure that you have included all the necessary details of each reference

Summaries/Examples of Styles

- International Committee of Medical Journal Editors Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Sample References
http://www.nlm.nih.gov/bsd/uniform_requirements.html
- How to Cite References/Vancouver Style, Murdoch University, Australia
<http://wwwlib.murdoch.edu.au/find/citation/vancouver.html>
- Blackwell Publishing Online/References
http://www.blackwellpublishing.com/authors/reference_text.asp
- BMA Reference Styles
<http://www.bma.org.uk/ap.nsf/Content/LIBReferenceStyles>

The sections appear in a journal style paper in the following prescribed order:

Experimental process	Section of Paper
What did I do in a nutshell?	<u>Abstract</u>
What is the problem?	<u>Introduction</u>
How did I solve the problem?	<u>Materials and Methods</u>
What did I find out?	<u>Results</u>
What does it mean?	<u>Discussion</u>
Who helped me out?	<u>Acknowledgments</u> (optional)
Whose work did I refer to?	<u>Literature Cited</u>
Extra Information	<u>Appendices</u> (optional)

Components of a Paper

Section	Purpose
Title	Clearly describes contents
Authors	Ensures recognition for the writer(s)
Abstract	Describes what was done
Key Words (some journals)	Ensures the article is correctly identified in abstracting and indexing services
Introduction	Explains the problem
Methods	Explains how the data were collected
Results	Describes what was discovered
Discussion	Discusses the implications of the findings
Acknowledgements	Ensures those who helped in the research are recognised
References	Ensures previously published work is recognised
Appendices (some journals)	Provides supplemental data for the expert reader

Publishing “PEARLS”

- **Counsel**

- seek out expert counsel: “unofficial review”
- intra-institutional, i.e. your center or neighboring center
- friends, colleagues, national experts
 - request less formal feedback to ease “burden”
- “Partner”: do not be afraid to add authors who help

SOME IMPORTANT LANGUAGE POINTS

1. For maximum readability, most sentence should be about 15-20 words, but not more than 30 words. For scientific article, paragraphs of about 150 words in length are considered optimal.
2. Avoid complex sentence structure containing more than 3 connectives.
3. Use simple and clean English.

เรื่องภาษา

- หลีกเลี่ยงการใช้คำซ้ำ

Use → Employ, Utilize

Show → Demonstrate, Illustrate, Display

(ใช้ Thesaurus)

- ประโยค **ไม่ควร** ยาวหรือสั้นเกินไป (ไม่เกิน 20 คำต่อประโยค)

- Sample 1

A 62-year-old man was admitted to this hospital because of paresthesia, weight loss, jaundice, and anemia. Diagnostic test results were received. (18 words, 5 words, respectively)

- Sample 2

In this study of treatments for recent-onset type 2 diabetes, metformin monotherapy was associated with durable glycemic control in about 50% of patients. (24 words)

GRAMMAR

Use past tense to describe:

- procedures, observations and data of your work.

Use present tense for:

general conclusions, conclusions of previous researchers, and generally accepted facts.

Thus, most of the Abstracts, Materials and Methods and Results will be in the **past tense**, and most of the Introduction and some of the Discussion will be in the **present tense**.

Sample 1

“Kochakarn and Lertsithichai (8) **demonstrated** that unilateral transurethral incision of the bladder neck **is** an effective treatment for primary bladder neck obstruction.

“On the other hand, this study **showed** that unilateral transurethral incision of the bladder neck **was** ineffective for such treatment (Table 2).”

Sample 2

“ Ratana-Olarn et al (5) **have shown** that early treatment of neurogenic bladder using CIC in children born with myelomeningocele **yields** better results than late treatment.”

“ But in this study early or late treatment of neurogenic bladder using CIC in children born with such condition **produced** the same result (Table 4).”

Sample 3

“The values for different concentrations of drug on the number of ABC cells **are** statistically different, indicating that the drug **inhibited** their growth.”

Space between number and unit

- Temperatures need spaces
 - between value and degree sign: 37 °C, not 37° C or 37°C
 - but the degree sign for angles goes with the number: 90° angle
- Centrifugal forces need spaces
 - on both sides of the "x"
 - 10,000 x g, not 10,000g or 10,000xg
- Other "places for spaces"
 - around equals sign: n = 3, not n=3
 - also around >, <, ~, etc
 - around plus/minus: 29 ± 7, not 29±7
- Percentages may be the only exception
 - 5% serum, 0.01% bromophenol blue
 - This is because % is not really a unit, just an indication that the value is presented as the "ratio to 100"

Appendix: Plurals

Examples of irregular plural nouns deriving from Latin or Greek

Singular	Plural	Examples
<i>-a</i>	<i>-ae</i> rarely <i>-ata</i>	<i>alga – algae, larva – larvae</i> <i>stoma – stomata</i>
<i>-ex</i>	<i>-ices</i>	<i>index – indices, apex – apices</i>
<i>-ies</i>	<i>-ies</i>	<i>species, series, facies</i>
<i>-is</i>	<i>-es</i>	<i>axis – axes, hypothesis – hypotheses</i>
<i>-ix</i>	<i>-ices</i>	<i>appendix – appendices, matrix – matrices</i>
<i>-on</i>	<i>-a</i>	<i>phenomenon – phenomena,</i> <i>criterion – criteria</i>
<i>-um</i>	<i>-a</i>	<i>datum – data, bacterium – bacteria</i>
<i>-us</i>	<i>-i</i> rarely <i>-uses</i> or <i>-era</i>	<i>locus – loci, fungus – fungi (or funguses)</i> <i>sinus – sinuses</i> <i>genus – genera</i>

It must be remembered that some nouns used in everyday English also have irregular plural forms (e.g. *woman – women, foot – feet, tooth – teeth, mouse – mice, leaf – leaves, life – lives, tomato – tomatoes*) or have no plural form (e.g. *equipment, information, news*). For more examples, see CSE (2006). If in doubt, consult a dictionary.

การเปรียบเทียบหัวข้อ

Whatever you do, keep the positives together and the negatives together

Disorganized:

- Subjects with myocardial infarction were less likely to be married, older, drank less alcohol, were better educated, and were more likely to smoke.

Clearer:

- Subjects with myocardial infarction were older, better educated, and more likely to smoke. They were less likely to be married or to drink alcohol.

อย่า Stake Claims

Do not brag about being the first, the best, the biggest, or the most rigorous.

Bragging:

- This phenomenon has never been previously reported in the English-language literature that we reviewed since 1980 using the keywords angina and penicillin.

Factual:

- Treatment of pharyngitis with penicillin V reduced symptoms of angina in our subjects.

การเขียนตัวเลข และ Formula

Most journals will not allow you to begin a sentence with an Arabic number.

Unacceptable:

- 116 subjects were enrolled. 23 patients died during the study.

Acceptable:

- We enrolled 116 subjects. During 2 years of follow-up, 23 patients died.

ระวังคำย่อ

Change:

- The effects of NSAIDs on PG synthesis in the GI tract are mediated through the COX system.

To:

- The effects of nonsteroidal antiinflammatory drugs on prostaglandin synthesis in the gastrointestinal tract are mediated through the cyclooxygenase (COX) system.

Clear writing

Keep it simple: use short, familiar words

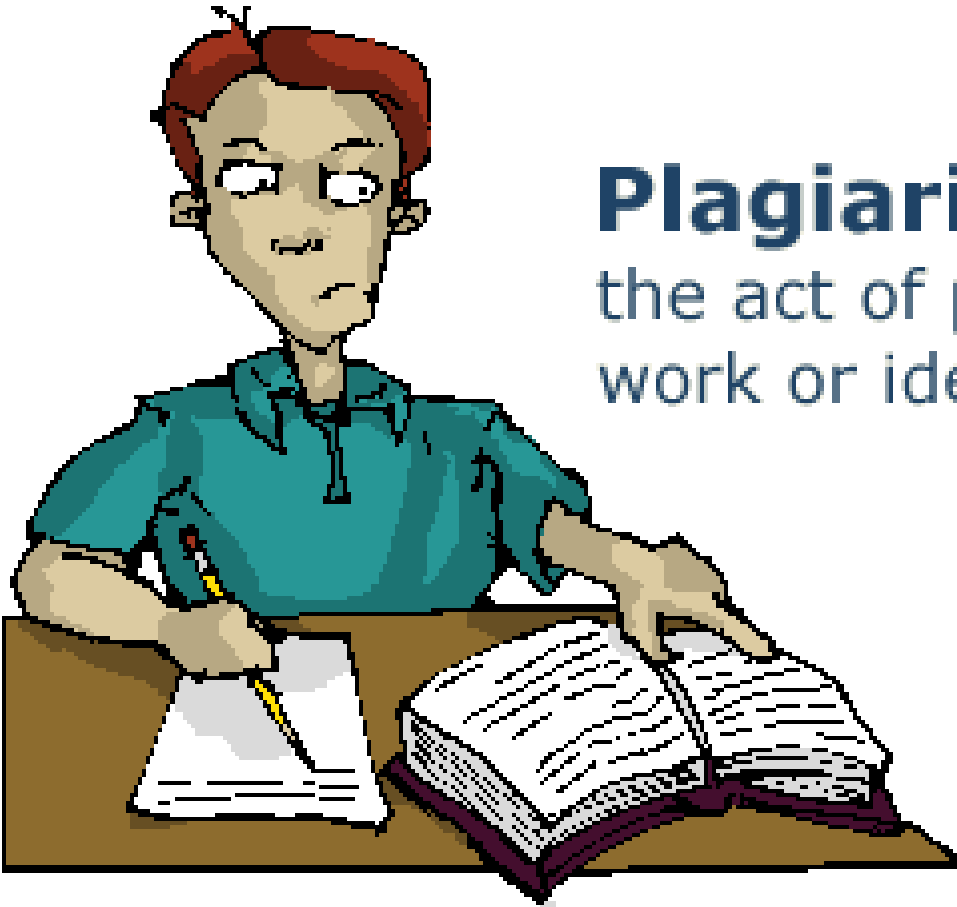
Avoid jargon and acronyms : ARITHMETIC

Be specific, not vague

Say what you mean and mean what you say

Avoid using a long sentence having more than 3 connectives, because it can be confusing and difficult to comprehend.

A sentence should not be longer than 20 – 30 words.



Plagiarism:

the act of presenting another's work or ideas as your own.

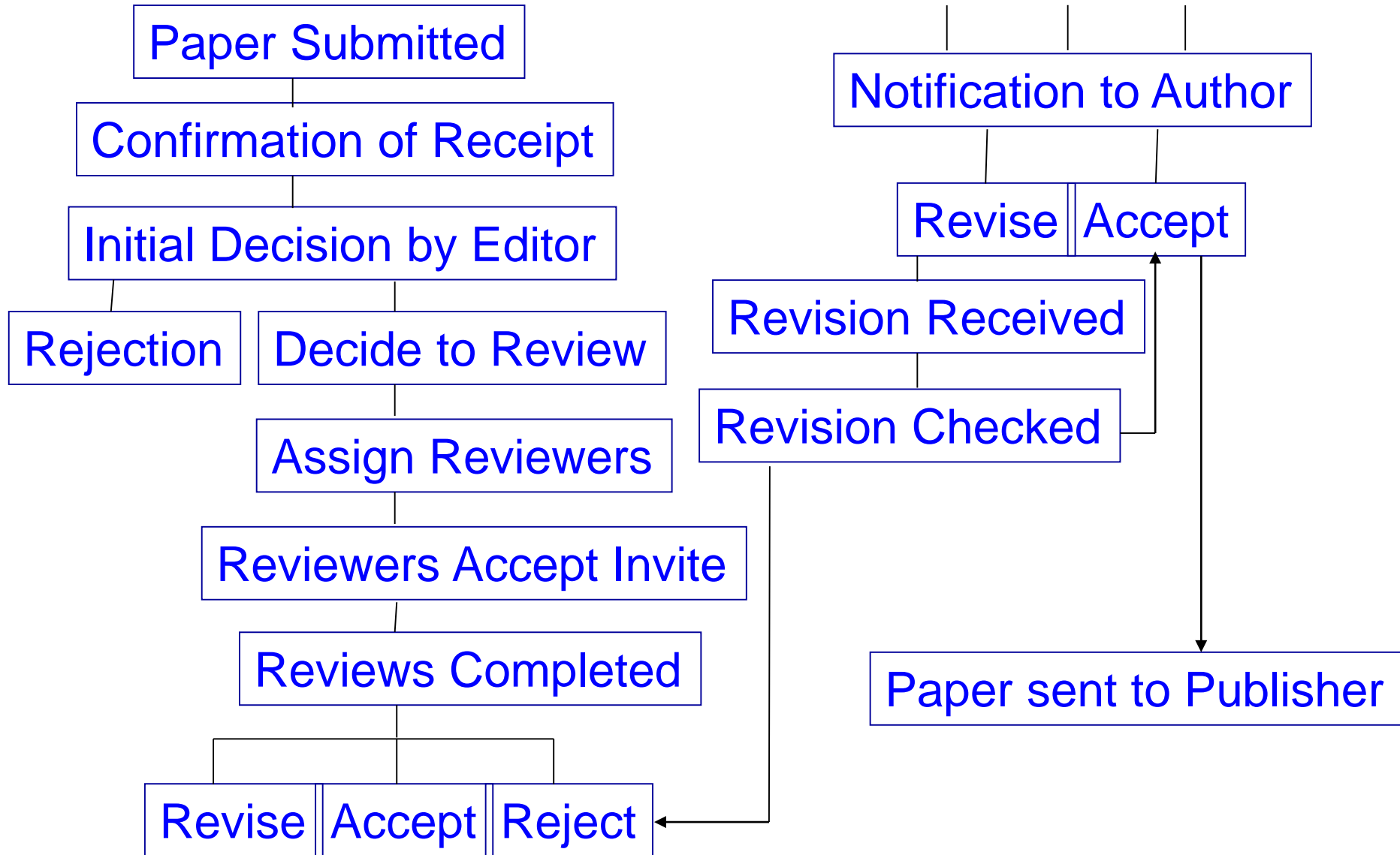


Paraphrase!!!

After Submission

- Most journal editors will make an initial decision on a paper - to review or to reject
- Most editors appoint two referees
- Refereeing speed varies tremendously between journals
- Authors should receive a decision of Accept, Accept with Revision (Minor or Major), or Reject
- If a paper is rejected, most editors will write to you explaining their decision
- After rejection, authors have the option of submitting the paper to another journal - editor's suggestions should be addressed

Overview of Peer Review Process

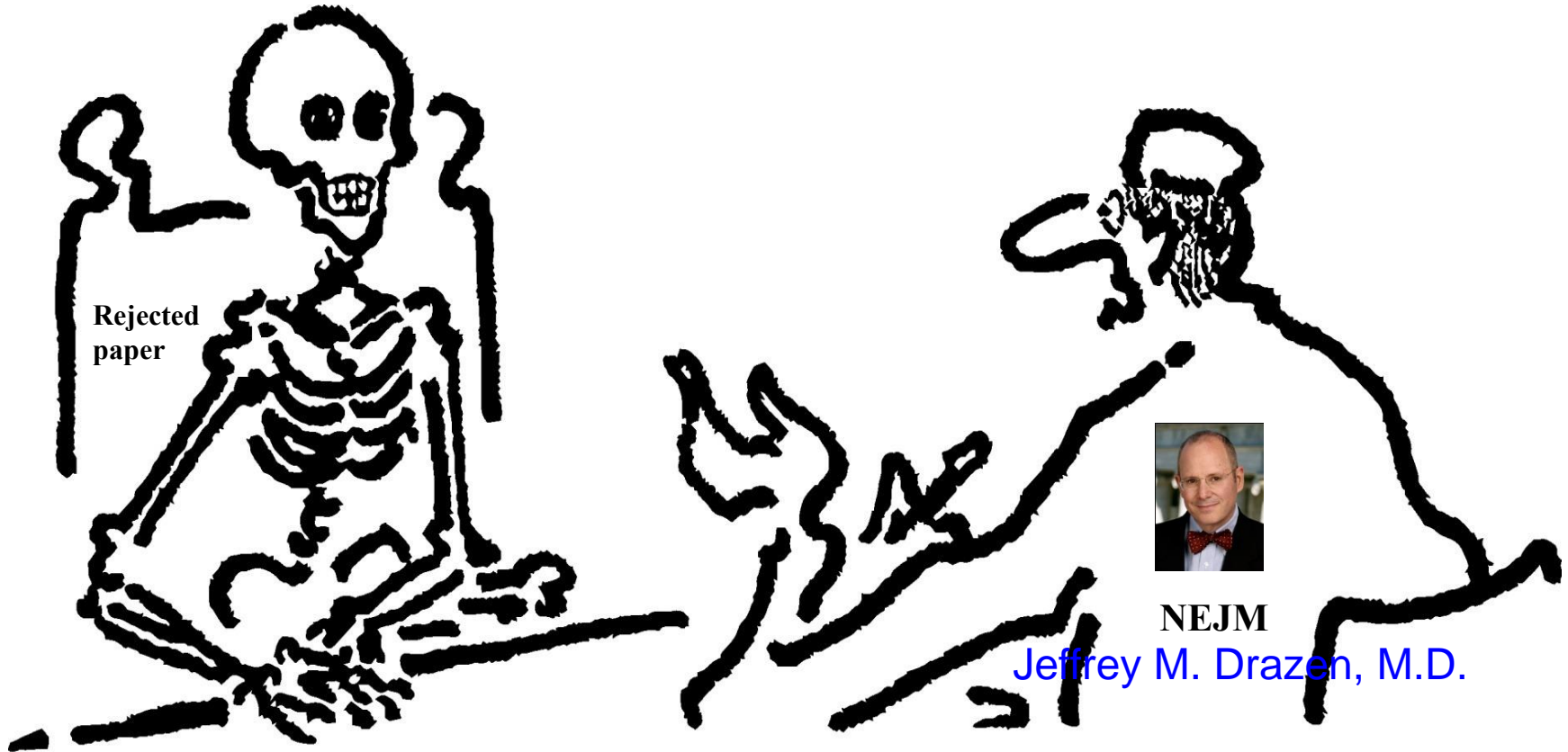


BEST OF LUCK

WITH YOUR SUBMISSIONS



NEJM Impact Factor (2014) = 55.873



Rejected
paper



NEJM

Jeffrey M. Drazen, M.D.

Novice
researcher

Mentor

“You should have come sooner.”

Writing manuscript เป็นเรื่องนักหนาสาหัส
จงยื่นหยัดฐูไปด้วยใจกล้า
ขอกุศลผลบุญช่วยชักพา
ให้ปีนปีหน้าเขียนเก่งเอย



อำนาจ ธิฐาพันธ์



The NEW ENGLAND
JOURNAL of MEDICINE

This certificate is hereby presented to
Amnuay Thithapandha, Ph.D., who has been
trained in academic scientific writing by our staff
and has met the high standard of our journal.

Given on 20th July 2013 in Boston, Mass., USA.

Jeffrey M. Drazen
Editor-in-chief, NEJM



Jane suddenly realised that her reference list had too many self citations...



**No work is finished
till the paper work is
done.**

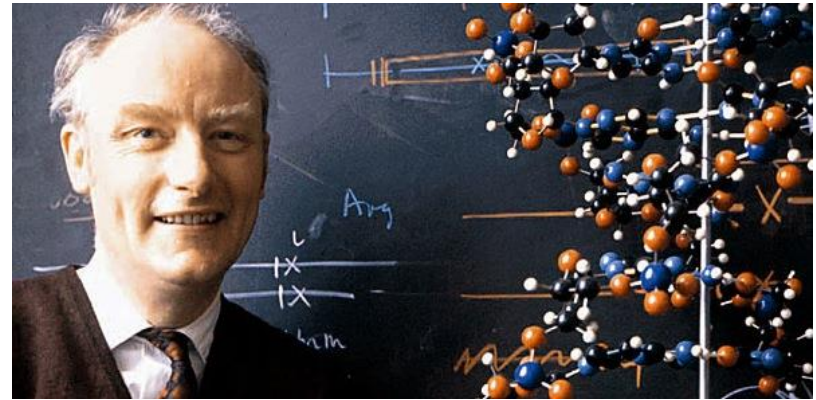


Have a good time

Prapon Wilairat

The Recognized Problem

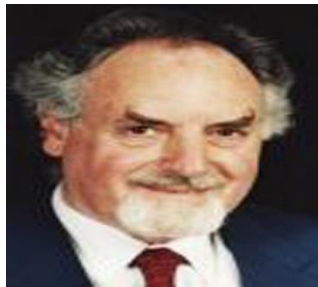
“There is no form of prose more difficult to understand and more tedious to read than the average scientific paper!”



Francis Crick

Key Difficulties

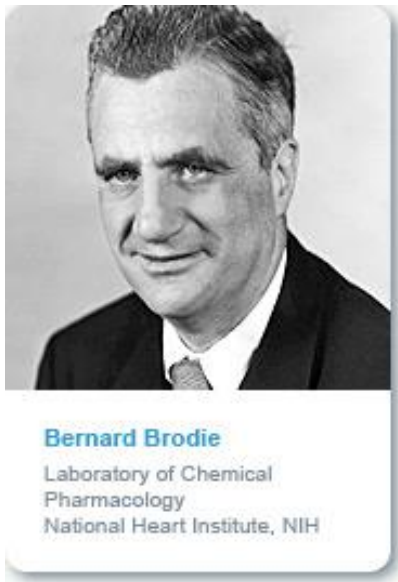
- **Many papers are poorly constructed and written**
 - **Often, scientists have not learned good manuscript writing techniques**
 - **Many do not enjoy writing, and do not take the time or effort to ensure that the prose is clear and logical**
 - **Peer review before submission is not made, but this is critical**



Geoffrey Burnstock

The most highly cited scientist of the last decade as surveyed by ISI

Poor experimentation cannot be masked by brilliant writing; however, poor writing can mask brilliant experimentation.



Bernard B. Brodie



"Oh, how I hate the re-writing!"

Further Resources

- Davis, Martha (2005) “Scientific Papers and Presentations”, 2nd Edition. Academic Press (ISBN 0-12-088424-0)
- Grossman, Michael (2004) “Writing and Presenting Scientific Papers”, 2nd edition, Nottingham University Press, (ISBN 1-897676-12-3).
- Clare, J & Hamilton, H (2003) “Writing research transforming Data into Text”, Churchill Livingstone (ISBN 0443071829).
- HINARI Publishing Skills Web-bibliography 11 2007
- Essential Health Links/Publishing Skills
<http://www.healthnet.org/essential-links/publishing-skills.html>