

# Scientific Writing: Getting Started

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# Why Publish?

- contributes knowledge
- allows feedback (improves work)
- Promotes career
  - document productivity
  - document impact on field/reputation
  - Advertises your lab for future trainees
- improves chances of funding

- Publish or Perish!

# The traditional IMRaD

- Introduction
- Methods
- Results
- Discussion

- Introduction: Why did you start?
- Methods: What did you do?
- Results: What did you find?
- Discussion: What does it all mean?

# A full paper consists of:

- Title
- Authors and Affiliation
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Acknowledgments (optional)
- References

# Types of Medical articles

- Editorial
- Original Article
- Review Article
- Short Communication (short papers)
- Case Reports
- Letter to Editor
- Personal Views

# Start Here!



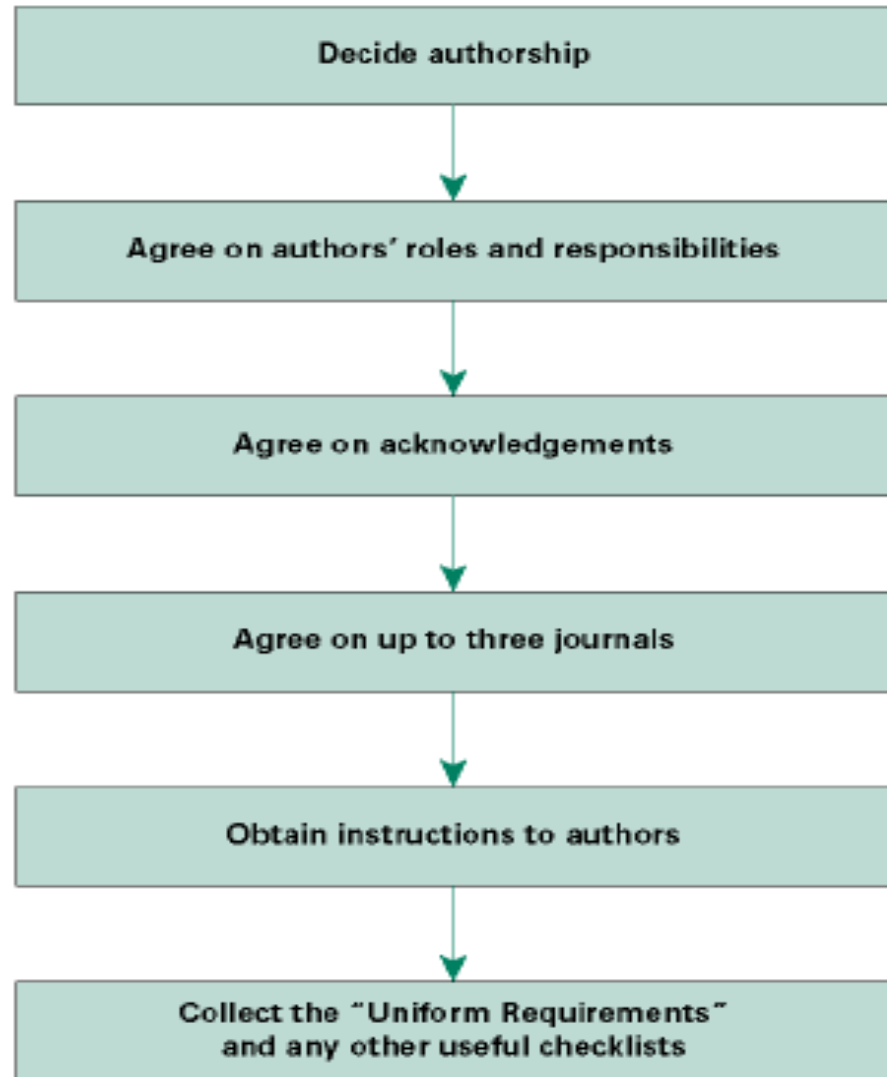
# Planning the study

- Identifies the problem
- Formulates the hypothesis
- Thinks about the design of the study

# Design of the study

- Involve a methodologist
- Study type
- Sample size
- Interventions
- Outcomes
- Ethics

# Politics first!



# Authorship

- Decide on authors, and their order, as early as possible
  - Preferably before starting the project
- Authors should only include those who made substantive *intellectual* contribution to the project reported, and can defend the data and conclusions publicly.

- Authorship credit should be based on
  - 1) **substantial** contributions to **conception** and **design**, or **acquisition** of data, or **analysis** and **interpretation** of data;
  - 2) **drafting** the article or **revising** it **critically** for important **intellectual** content;
  - and 3) **final approval** of the version to be published.
- Authors should meet conditions **1**, **2**, and **3**.

# Questions journals ask

- Is the research question important?
- Is it interesting to our readers?
- Is it valid? A scientifically sound study.

# What editors look for

- Short, clear, precise title
- Good abstract
- Good design and methods
- Clear conclusions
- Brevity
- Follow instructions

# What reviewers look for

- Good design and methods
- Simple tables and figures
- Logical organisation
- Brevity
- Balance
- Appropriate statistics
- Their papers



1. Design well
2. Decide politics
3. Choose journal
4. Read instructions to authors/papers
5. Set framework
6. Prepare drafts
7. Distribute
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# Order of writing?

1. Results
2. Methods
3. Introduction
4. Discussion
5. Abstract
6. References

# Title

- First thing that readers and editors see and read.
- Key elements that advertises the paper's contents
  - Informative and Specific
- Maybe helpful to choose the title when the paper is complete

# Title

- Short and simple
- State subject, not conclusion
- Include study design
- Include time and place if necessary
- Begin with a keyword
- Avoid abbreviations
- Remove empty phrases such as “ A study of...”
- Use Subtitles (notice number of words) “Exercise and Coronary Heart Disease: Framingham Offspring Study”

# Introduction

- General, concise description of problem
  - background to the work
  - previous research
- where that work is deficient
  - how your research will be better
- State the hypothesis

# Inverted pyramid

Oxidative stress plays an important role in....

When LDL particles are oxidized ...

Antioxidants are important...

...Paraoxonase...

# Introduction

- Don't make it a review article
- Don't put down every all previous studies
- Don't explain pathophysiology irrelevant to your study
- Define specialized terms or abbreviations you want to use



# Introduction

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We wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological importance.

*Watson JD, Crick FHC. A structure for deoxyribose nucleic acid. Nature 1953; 171: 737-8.*

# Methods

- Allows reader to judge the quality of the work
- Identifies weaknesses
- Allows repetition of the study
- State the study design

# Methods

- Study design (sampling procedure)
- Define variables
- Patient inclusion
- Dates
- Randomisation
- Ethics/ consent
- Treatments
- Outcomes and endpoints
- Statistical methods
- power

# METHODS

## Provide Details

- **Enough to permit replication; or to assess validity of findings; quality of study**
- **Tell the story: “To assess xyz, we did the hoodgie-wadjie procedure, using Blatz technique (3)”**
- **if new measures or procedures, describe in detail in appendix.**

# *A note on ethics*

A legal obligation

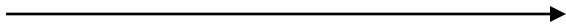
Most editors refuse to publish without approval by IRB

Consents: informed/oral

# Results

- Be enthusiastic
- Be logical
- Provide numbers and variability

# Results

Simple  complex

- Describe the population
- Establish how comparable your groups were
- Use a mixture of text, tables and figures
- Mention units of measurement
- Mention what numbers, brackets, etc. refer to
  - 9(SD=4), 854 (12.3%)
- Bring and explain P values

# Results

Provide only enough interpretation to lead the reader from one experiment to the other

- Avoid lengthy analysis and comparison to the work of others
- No need to follow chronology of study
  - Rather, provide a logical progression and tell a story



# Results

- “Stand alone” tables
- Make sure totals add to 100%
- Do not repeat the Tables and Figures in text
  - Summarize: eg, there were no significant associations...
  - Describe: eg there was a three fold increase in the risk of ..

# Tables and Figures

- Title text - brief
  - Convey max. amount of information
  - Placed and punctuated uniformly
- Legend
  - Fully self -explanatory
- Tables and figures must be mentioned at least once in the body of the text
- Explain abbreviations as footnotes

# Figures

- Professionally produced
- Clearly labelled axes, lines etc
- Informative legend
- Appropriate plots

# Illustrations

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- **Purpose-specific**
- **Graphs**
  - **Line: usually event in relation to time**
  - **Bar: comparisons**
  - **Pie: parts of a whole**
  - **Histogram: frequency distribution**
  - **Scatter: associations between variables**

# Illustrations

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- **Photographs, pictures**
  - Technique
  - Before and after
  - Show an event
- **Flow charts**
  - Process, sequence, systems
  - Algorithms

# Recommend

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- **Look at recent issue of journal**
- **Use a similar published figure as a template**
- **Read journal instructions**

# Discussion

# Function

1. To interpret your results in light of **what was already known about the subject** of the investigation.
2. To explain our new understanding of the problem after taking your results into consideration.



1. Do your results provide answers to your testable hypotheses?

If so, how do you interpret your findings?

2. Do your findings agree with what others have shown?

If not, do they suggest an alternative explanation or perhaps a unforeseen design flaw in your experiment (or theirs?)

3. Given your conclusions, what is our new understanding of the problem you investigated and outlined in the Introduction?

4. Explain weaknesses, shortcomings.

Be fair: this will build trust.

Don't over-criticize yourself, don't go to unnecessary details.

5. If warranted, what would be the next step in your study, e.g., what experiments would you do next?

# Discussion

- Reverse of Introduction (pyramid)

*Do not introduce new results in the Discussion*

# Abstract

- Summarizes the major findings in the broad context of the work
- Consists of two or three sentences of topic introduction
- Selected results (not all but the most important)
- Concludes with implications of work



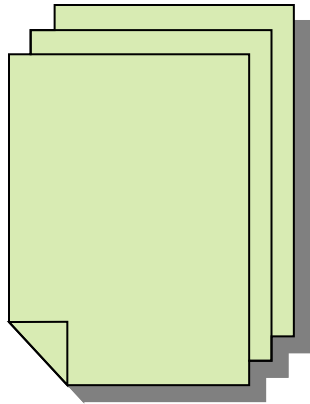
# References

- Appropriate format
- Don't over self-cite
- Avoid conference abstracts
- Select carefully — balance authors used
- Only 1 or 2 references per point
- Use recent review articles

# Research Paper

Now is the time for all  
good men to come to  
the aid of their country.  
(citation)

**References**  
- Bibliographic citation



**Stack of  
References:**  
Journal articles  
Book chapters  
Web sites  
Monographs

# Endnote Library of References

Author	Year	Title	URL	Secondary Title
		Boltzmann's Constant (k)		
	1971	Valdez v. Black		F.2d
	1974	Geophysical Research Letters		Sedimentary Geol
	1990	New Mexico Geological Society public...		
	1994	National Environmental Policy Act of 1...		U.S.C.
	1997	Exchange of ideas and information on ...	<a href="http://energy...">http://energy...</a>	Committee on Ene
	1998	Eocene fossils	<a href="http://www.co...">http://www.co...</a>	
	1999	Sequoia Ecosystem and Recreation P...		
	2002	Personalities in Paleontology	<a href="http://www.a...">http://www.a...</a>	
Allen	1988	Modern-period muddy sediments in th...		Sedimentary Geol
Alvarez	1984	Evidence from crater ages for periodic...		Nature
Angell	1988	Relation of Antarctic 100 mb temperat...		Geophysical Rese
Apollonov	1988	Batyrbay section, South Kazakhstan, U...		Geological Magaz
Argus	1991	Stratigraphic excavation techniques fo...		Journal of Paleont
Argus	1993	New paleontological excavation techni...		Journal of Paleont
Babcock	1988	New Permian conulariids from Devon I...		Journal Of Paleont

Showing 200 out of 200 references. Show Preview

# POLISH

- revise, revise, and revise for:  
accuracy, brevity, clarity, grace
- accuracy: spelling, figures differ in tables and text; too many decimals
- brevity: empty phrases and words; excessive weak verbs and connectives
- clarity: first person; basic grammar
- grace: choice of words; vary sentences

**Thank you**

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