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MEDIZINISCHE PRIVATUNIVERSITÄT

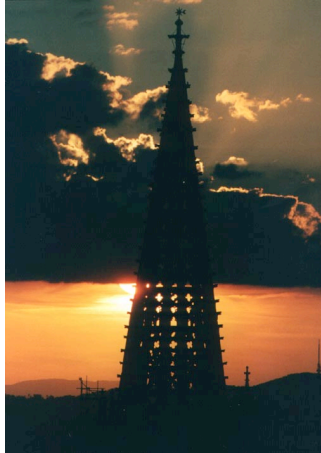OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

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From Data to Publication How to Successfully Submit a Journal Paper

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„Aesthetics" of Scientific Writing ?

No poetry, but its own „functional" aesthetics !

Writing is like having a baby: The gestational period is long and the labor is painful, but in the end you have something to show for.
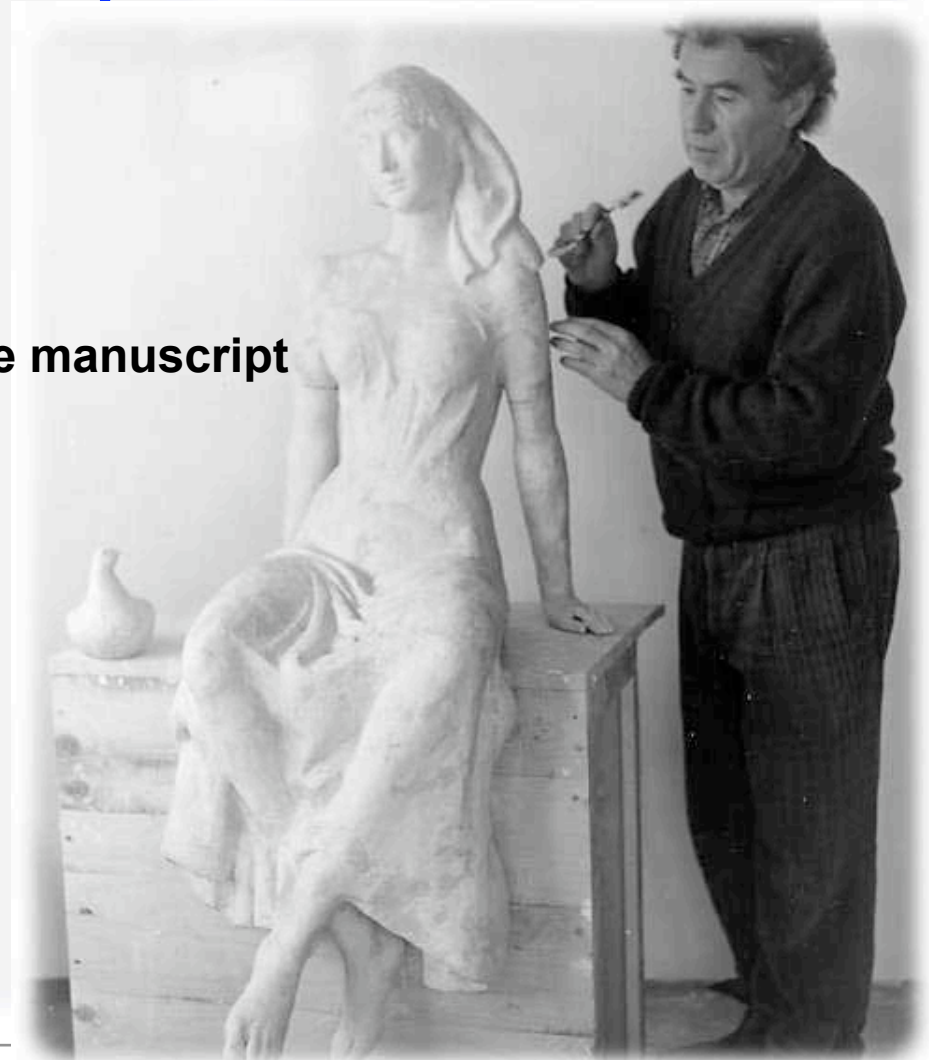**Apley 1993**

A publication should be a piece of art !

Step 2: The manuscript

Step 1: The study

Both steps are equally important & equally demanding !

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What is GOOD writing ?

Writing is a demanding, personal task. Any piece of writing, scientific or not,
assumes the personality and philosophy of the writer.
Writing styles are more or less arbitrary, and preferences vary widely.
One cannot argue a single style or approach is best, for then variations
(even with "good" writing) are infinite.

However, most agree that **clear & concise** writing most effectively communicates ideas.

Few scientific writers in fact practice clear, concise exposition.
Few know the principles of such writing, Fewer still practice them.

Most traditional scientific curricula fail to demand adequate courses
and practice in expository writing.

Dick Brand – Editor CORR

Logical Flow:

➢ Each paragraph should deal with one (major) subject only

➢ First sentence of the paragraph introduces the subjects and contains the most important idea

➢ Following sentences extend on or modify the main idea (sentence 1)

➢ The last sentence connects the current paragraph logically with the next one !

A common mistake

➢ The "one citation" -> one paragraph technique

➢ Provides only little intellectual integration

Brevity:

• Readers (and reviewers) have LITTLE time to read

• Readers (and reviewers) are often TIRED when they read

Therefore:….

• Express each ideal only once in the paper (few exceptions)

• Try to shorten, and shorten again, and shorten again….

• Do not use "filling" words.

• One subordinate clause (per sentence) is the maximum (particular difficult for Germans – Thomas Mann syndrome), rather make it two sentences

Brevity:

• <u>Introduction:</u> Focus it on key questions and key hypotheses (no historic literature review).
You do NOT need to state that OA is an important disease.

• <u>Methods:</u> Refer to previous papers, if method published

• <u>Results:</u> Put data in tables/figures; provide a "story" in text

• <u>Discussion</u>: Focus on key questions/hypotheses and on validity of your methods (in context of these).
You do not need to save the world (yet).

<u>Example:</u>
The results of the bone failure tests are shown in Table 1. When testing the bones in a 3-point bending configuration, using a self-constructing apparatus, the failure load of the femur was 4500 +/- 1200 N, the failure load of the tibia was 3500 +/- 1100 N, the failure load of the humerus was 2200 +/- 800 N, and the failure load of the radius was 1500 +/- 500 N. (70 words, 366 characters)

Example:
The results of the bone failure tests are shown in Table 1. When testing the bones in a 3-point bending configuration, using a self-constructing apparatus, the failure load of the femur was 4500 +/- 1200 N, the failure load of the tibia was 3500 +/- 1100 N, the failure load of the humerus was 2200 +/- 800 N, and the failure load of the radius was 1500 +/- 500 N.
(70 words, 366 characters)

The failure loads (Tab. 1) ranged from 1500 N (radius) to 4500 N (femur).

(14 words, 73 characters)   Ratio 1:5

Step by Step

- Title
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- Tables/Figures
- References

- Accompanying letter
- Itemized response letter (to reviewers)

Be courageous !

i.e. Barololin Serum levels do not predict incident OA

is better than

Association of Barololin serum levels with the onset of OA

The most important (30 to 60% of reviewer decision) !

• ALSO VERY IMPORT, because this is all most people read
• with <u>little</u> experience, write it <u>last</u>
• with <u>more</u> experience, write it <u>first</u>

• 1 sentence on background/rationale (why is the question/ hypothesis you address interesting ?)
• 1 sentence on objective (question/hypothesis)
• Methods (as specific as possible)
• Results, with (quantitative) data and significance levels
• Conclusions (must be supported by actual data)

Probably the most "artistic" part of the paper !

(1.5 pages maximum)

1. Introduce a <u>specific</u> clinical or scientific problem (should not be trivial and have a direct link with the study)
2. Report previous observations/results leading to open questions
3. Introduce open questions (are they important ?)
4. Potentially introduce study design
5. State open questions or hypotheses that you will directly answer with your experiment (depend. and indep. variables)

It is insufficient to state that something was not examined before, it may simply be too boring !

The reader (and reviewer) must be able to appreciate here what we will really learn !

<u>Examples</u>

No so good !
This study aims to make a contribution to a better understanding of the substances "Superheal", "Megasuper-heal" and "Superbreak" in the context of bone fracture healing

Better !
This study was designed to test the following hypotheses:
• Superheal can significantly shorten the healing time in an rabbit model of femoral fracture.
• Megasuperheal, given in combination with Superheal, can further shorten the healing time versus Superheal alone.
• Superbreak can fully antagonize the effects of Superheal (and Megasuperheal) in this fracture model.

Not as easy as most people think !

- Provide sufficient detail on study sample (that differences with other studies can be appreciated later)
- Provide sufficient technical detail that others can repeat the experiment
- Explain methodological concepts (and why you used them)
- Refer to the validity and reproducibility of your method
- Do not forget ethics approval / animal study approval
- Do not forget description of statistical methods

- When paper length is restricted (i.e. 4000w in O&C and 3000w in ARD) this may need a lot of fine-tuning (and potentially some compromises).

The first step towards synthesis !

- The text should not provide a list of numbers -> Tables
- Synthesize (but do not interpret) the findings -> create a story
- Let the questions/hypotheses guide how you present results:

  - First sentence of each paragraph should state a key result (and refer to one of the questions/hypotheses)
  - Further details may follow in next sentence
  - Reading the first sentence of each paragraph should provide reader with main story
  - Do not use references here (interpretation)
  - A good section to reduce word count.

Discussion

The creative playground !

- You may want to summarize key questions/hypotheses and key results (no numbers here) first. This is the one and only time where you are allowed to repeat something !)
- Critically discuss your study sample, study design and methods (all studies have limitations !), but make clear that these limitations do not question your results/conclusions
- Then put your results into the context of findings in the literature (without repeating your results !)
- Do not discuss paper by paper, but finding by finding
- Speculate why differences may exist, or frankly state… We have no explanation, why our results differ from those of….

The most important !

- In conclusion we find that….
- Clearly answer the questions/hypothesis you stated upfront and take the answers further to explains what this means
- But conclusions should never to beyond what you have found
- i.e.: Superheal has been shown to be effective in the treatment of fractures ?

BE COURAGEOUS TO PUBLSH NEGATIVE CONCLUSIONS
(to avoid publication bias and to save a lot of work to others)

The most important !

- In conclusion we find that….
- Clearly answer the questions/hypothesis you stated upfront and take the answers further to explains what this means
- But conclusions should never to beyond what you have found
- i.e.: Superheal has been shown to be effective in the treatment of fractures ?
- NOT REALLY, BUT
- i.e.: Superheal at a dosage of Xml has been shown to be to shorten fracture healing in an established rabbit model of femoral fracture

Conclusion (last para of Discussion)

The most important !

- In conclusion we find that….
- Clearly answer the questions/hypothesis you stated upfront and take the answers further to explains what this means
- But conclusions should never to beyond what you have found
- i.e.: Superheal has been shown to be effective in the treatment of fractures ?
- NOT REALLY, BUT
- i.e.: Superheal at a dosage of XXX has been shown to be to shorten fracture healing in an established rabbit model of femoral fracture
- NEVER say: These results show that more research is needed……(maybe: a next step in elucidating X may be..)

The most important !

- In conclusion we find that….
- Clearly answer the questions/hypothesis you stated upfront and take the answers further to explains what this means
- But conclusions should never to beyond what you have found

BE COURAGEOUS TO PUBLSH NEGATIVE CONCLUSIONS
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Be accurate !

- Respect journal format
- Do justice to the field, but do not be excessive
- Focus on studies that have lead to the open questions or that have addressed the same/similar questions
- Be careful when stating: These authors have
  - shown / observed / reported….
  - stated / claimed / hypothesized / speculated….
- Always go back to the primary reference
  - (i.e. do not cite epidemiological data from an experimental paper, because the epidemiological data are cited in the introduction)

This is where you can put A LOT OF DATA !

Table
- There needs to be more than 1 column and 1 row
- All abbreviations must be explained (even if explained in text)
- Provide very clear headers (and legends)

Figures
- Ideally one figure per questions/hypothesis
- Figures should tell the main story as "stand alone"
- Legends may refer to questions/hypothesis and synthesize the key findings pertaining to them (or even provide conclusions)

- But, often No of tables/figures limited by journal

Method paper: Focuses on methods and techniques

- State limitations of current methodology (without being arrogant)
- Validate and show precision (reproducibility) of new method
- CLEARLY define criteria, why which you can quantitative show that the NEW method is better than the TRADTIONAL one(s).

Thesis: All of the above above applies

- May add a (thorough) chapter on literature review
- More space to provide tables, figures, examples

Choice of journal

- Question or readership and impact factor ?
- Look at you reference list !
- Is the question relevant enough for a given journal (i.e. clinical journal – technical paper)
- How much time to you have until article is published ?

Accompanying letter

- Always a nice gesture
- Potentially refer to your previous publications in the journal and say how the current work extends on it.

Do NEVER take this easy !

- A good itemized letter is the key to success:
  1. Reviewer's comment
  2. Your answer, how you dealt with it and why
  3. Cite the sentence/paragraph in the paper that was changed
- Do not assume the reviewer remembers his first review
- If the reviewer has misunderstood the paper, there is usually something to improve (at least try to say you have tried)
- You must convince the reviewer, not the other way around
- Letter may be longer than the paper itself
- Always offer something to the reviewer (to each point)
- If you are fighting with the length limitations, say so.
- One you loose, one you win…. Do not take it personal !
- When writing to the editor, think twice whether (s)he has a choice ?

Respond to Review

To the editor

- We thank you for giving us the opportunity to revise..
- We feel that the suggestions of the reviewer have clearly helped to improve the manuscript (even if it is not always true)
- In the itemized review letter, we explain how we have dealt with the reviewers' comments on a point-by-point basis

To the reviewer

- We thank the reviewer for pointing this out…..
  - We agree with the reviewer that…. and have
  - We feel there is a misunderstanding… In order to express this idea more clearly, we have now….
  - We feel the comment is unjustified, the manuscript states on page XXX that..

Always point out the changes you have made in the text:
On p. 6 we now state: *Superbreak and superheal both……*

3 Key Points

- Is there a question, and is it interesting ?
- N =
- Is there a relevant conclusion, pertaining to an important / interesting biological or clinical problem

Accompanying letter

- Always a nice gesture
- Potentially refer to your previous publications in the journal and say how the current work extends on it.

Recommended Reading

1.) Day, Robert A. How to Write and Publish a Scientific Paper. ISI Press. Philadelphia,1979.

2.) Huth, Edward J. How to Write and Publish Papers in the Medical Sciences. ISI Press.Philadelphia, 1982.

3.) Katz, Michael J. Elements of the Scientific Paper: A Set-by-Step Guide for Students and Professionals. Yale University Press, New Haven, 1985.

4.) King, Lester S. Why Not Say It Clearly: A Guide to Expository Writing. 2nd Ed. Little, Brown and Company, Boston, 1991.

5.) Shertzer, Margaret. The Elements of Grammar. Macmillan Publishing Company, New York, 1986.

6.) Strunk, Jr., William and White, E.G. The Elements of Style. 3rd Ed. Macmillan Publishing Co, New York, 1979.

7.) Brand RA, Heckman JD, Scott J. Changing ethical standards in scientific publication. Clin Orthop. 2004 Sep;(426):1-2.

8.) Brand RA, Huiskes R. Structural outline of an archival paper for the Journal of Biomechanics. J Biomech. 2001 Nov;34(11):1371-4.

9.) Gopen G: The Sense of Structure: Writing from the Reader's Perspective

10.) http://www.fairfield.k12.ct.us/wardehs/cwardehs03/sciwriting.htm

- **Be(come) an artist**
- **Be prepared for lifelong learning**
- **Have fun being creative**

Thanks for listing !

- **Would you like to participate in OARSI committee work ?**

➢ **YI breakfast workshop planning**

➢ **YI get together planning**

➢ **other workshops etc.**

Please write to:

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