How to write a research manuscript

EuroCVP

Stockholm December 13th 2019

AG Semb, BMedSci MD PhD FESC
Consultant cardiologist, senior researcher
Preventive Cardio-Rheuma clinic
Dept. of Rheumatology, Diakonhjemmet Hospital
Oslo, Norway

By courtesy of
Svenn Wassmann, MD, PhD, FESC
Munich, Germany

ESC Working Group Cardiovascular Pharmacotherapy

Disclosures

A.G. Semb has received speaker honoraria and/or consulting fee from Merck/Schering-Plough, BMS, UCB, Pfizer/Wyeth, Novartis, AbbVie, Sanofi, KPMG, Bayer and Lilly

ESC Working Group Cardiovascular Pharmacotherapy

Publish and perish- “The Seven Deadly Sins”

Data manipulation, falsification

Fraud in Medicine

EDITORIAL

News and Comment

Coping with Fraud: The Darsee Case

New evidence suggests that papers publish
journals contain fabricated data from Emory as w

It has been nearly 2 years since John R. Darsee was caught fabricating data in an experiment at the Harvard Medical School, where he was a fellow in the Cardiac Research Laboratory headed by Eugene Braunwald. The Darsee case is one of a handful of well-publicized incidents of fraud that have occurred within the past few years at some of the country's most prominent academic institutions. In their wake, unprecedented attention is being focused on the causes of research fraud and the way institutions respond to evidence that someone has fabricated results.

Darsee was caught in the act of falsifying data on 21 May 1981 during an experiment on dogs in Braunwald's laboratory at the Brigham and Women's Hospital, a Harvard affiliate. The incident precipitated a complex and costly series of responses, first at Harvard and subsequently elsewhere. After privately notifying Harvard officials, Braunwald and his principal research deputy, Robert Kloner, began an internal review of Darsee's research that would go on for more than 1½ years. In late November 1981, after it appeared that Darsee's fraud extended to a major collaborative study sponsored by the National Institutes of Health (NIH)—on which Darsee continued to work even after he was caught fabricating data—the dean of Harvard.

mendation that Darsee be debarred from receiving NIH funds or sitting on advisory bodies for 10 years (*Science*, 25 Feb., p. 937). Formal debarment proceedings are now under way in what may be the harshest sanction NIH has ever levied against a scientist. The case has been referred to the Justice Department.

Meanwhile, back at Harvard, medical school faculty, working with the university's general counsel, were drafting guidelines about what to do if a Darsee-like incident were to happen again. A policy statement was released in Febru-

Harvard record an

Darsee's first kn
21 May incident—
of data that had b
over a period of a
look as if the dat
over 2 weeks. It
because he virtual
be caught by fabri
sight of co-worke
1982, p. 478). W
Braunwald and Kl
the fabrication and
the while insisting

Eugene Braunwald *"I got a bum rap."*

Fabricating large amounts
of data from experiments
which he had never conducted
Mentor Eugene Braunwald - Harvard

List of scientific misconduct incidents

reality and prepare for a more challenging future."

o Editor at *Nature*
siologists who work
Melton and John
o make a thorough
andling of both papers and to make recommendations
otect both the journal and the scientific community from
nd.

Publish and perish- "The Seven Deadly Sins"

Data manipulation, falsification

Duplication manuscripts

Plagiarism – software to detect

Redundant publication

What constitutes redundant publication?

Data in conference abstract?	**No**
Same data, different journal?	**Yes**
Data on website?	**Maybe**
Data included in review article?	**OK with permission**
Expansion of published data set?	**Yes**

ESC Working Group Cardiovascular Pharmacotherapy

Publish and perish- "The Seven Deadly Sins"

Data manipulation, falsification

Duplication manuscripts – software to detect

Plagiarism

Redundant publication

Author conflicts of interest

Animal use concerns – ethics

Humans use concerns - **GDPR** General Data Protection Regulation

- **DPIA** Data Protection Impact Assessment

ESC Working Group Cardiovascular Pharmacotherapy

Statistics and data manipulation

- Use statistics to make the most of your data
- Do not use statistics to manipulate your results
- Fishing for results
- Salami slicing

ESC Working Group Cardiovascular Pharmacotherapy

Quantify and Analyse properly

There are lies,
damn lies
and statistics

Statistics are for the masses, but not for the individual

Benjamin Disraeli, British Prime Minister

What makes a good research paper?

- Good science
- Innovative topic
- Solid data
- Good writing
- Dissemination

ESC Working Group Cardiovascular Pharmacotherapy

What constitutes good/significant research?

Innovative therapies

new mechanism of action

aimed at treating an un-met medical need

significant and clinically meaningful benefit

What constitutes a good journal

Impact Factor –

average number of times published papers are cited up to 2 years after publication / number of published papers

Immediacy Index –

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

ESC Working Group Cardiovascular Pharmacotherapy

Authorship

GUIDELINES ON AUTHORSHIP

Each author should have participated sufficiently in the work to take public responsibility for the content. This participation must include: (*a*) conception or design, or analysis and interpretation of data, or both; (*b*) drafting the article or revising it for critically important intellectual content; and (*c*) final approval of the version to be published. Participation solely in the collection of data does not justify authorship.

Prepare your ms – start with the results

- Gather all raw data, analyses, plots and tables
- Organise results according to a logical sequence
- Choose the data to use in figures
- 6-8 figures are usually a good number to start with – end up with 2-3
- Discuss the data with your colleagues and note down important points

NB! From your results -
Decide the focus of your paper!

ESC Working Group Cardiovascular Pharmacotherapy

Before writing consider

"Those who have the most to say usually say it with the fewest words"

ESC Working Group Cardiovascular Pharmacotherapy

Prepare your manuscript

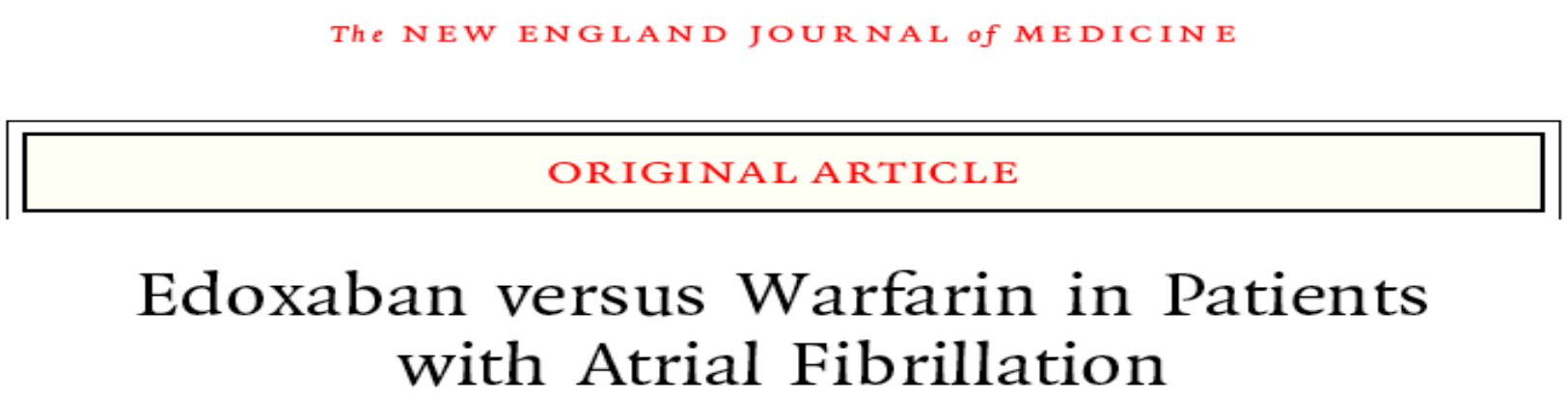
Write the study protocol as if it is the manuscript without result and discussion and you will have your manuscript already structured

- **Identify the most important findings emerging from the data and make them the central theme of the article**
- **Focus on the readers of the journal that you are considering to publish your work**
- **Prepare figures, schemes and tables carefully**

ESC Working Group Cardiovascular Pharmacotherapy

Manuscript title and authors

- **The title must be simple, attractive and must reflect the investigation or the finding**



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Edoxaban versus Warfarin in Patients with Atrial Fibrillation

ESC Working Group Cardiovascular Pharmacotherapy

Manuscript Structure

- Abstract
- Introduction
- Material and Methods
- Results
- Discussion and Conclusions
- Acknowledgements
- References
- Figures and Tables
- Additional online material

ESC Working Group Cardiovascular Pharmacotherapy

Abstract

Summary of manuscript (200-300 Words)

- Problem investigated - background
- Purpose of research - aim
- Methods
- Results
- Conclusion

ESC Working Group Cardiovascular Pharmacotherapy

Introduction

Background on the topic

2-3 paragraphs to discuss previous research

Focused background information

Need for study

Focus of paper

Hypothesis and aim

Overall 300-500 words

ESC Working Group Cardiovascular Pharmacotherapy

Material and Methods

Provides instruction on exactly how the study has been conducted

- Subjects/patients
- Sample size justification
- Description of the methods
- Experimental drugs and randomisation/masking
- Data collection
- Data analysis techniques
- Ethical considerations – DPO-GDPR/DPIA etc

ESC Working Group Cardiovascular Pharmacotherapy

Material and Methods

Common Mistakes

- Too little information
- Too much information on well known tests
- Unclear flow of procedures
- Too many / complex sentences
- Results / sources of error reported

Results

Objective presentation of experiment results

- Summary of data

NOT a Discussion!

Common mistakes

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

Discussion

List the main findings of the study in the first 2-3 sentences

Interpret the results

- Did the study confirm/deny the hypothesis?
- Did the results provide an alternative hypothesis?
- What interpretation can be made?
- Are the results in agreement with previous research
- Possible sources of error/anomalous data behaviour
- Implications of the study for the field
- Limitations and strengths

ESC Working Group Cardiovascular Pharmacotherapy

Discussion

Common Mistakes

- Mixing it with results
- Discuss results that have not been presented
- Broad statements and conclusions not substantiated by data
- Incorrectly discussing inconclusive results
- Ambiguous data sources
- Missing information

Conclusion / Acknowledgments

Conclusion

Short summary of major findings followed by brief sentence on future perspectives and/or application of present work

Important: Do not rewrite the same conclusion of the abstract

Acknowledgments

Remember to thank the funding source

Colleagues/scientists/technicians who might have provided assistance

References

The styles vary for different journals. Check referencing style of journal
Use f ex. ENDNOTE, RefWorks, RefMan – do not use free versions from web

Check for the accuracy of all citations

Reference:

Articles from Peer-reviewed journal, abstracts (not more than 2 years old), from books

Should not reference:

Articles from non-peer-reviewed journals or personal communications

Before submission

Leave it for a week or two before the final revision

Get feedback from advisor and colleagues

Make sure the paper is read by at least one or two colleagues who are not familiar with the specific work

Check for spelling, grammar, consistency in terms and abbreviations, accuracy of tables, figures, references, …

DON´T BE SLOPPY!

Revision

- **Read comments carefully**

If a reviewer misunderstands a point, the point probably needs revision

- **Be polite and respectful when disagreeing a reviewer's comment but no need to be submissive**
- **Include a point-by-point response to each reviewers' comment with an explanation of the changes made with page and line ref to the text were the changes are included**

What to do if a paper gets rejected

Reason for rejections:

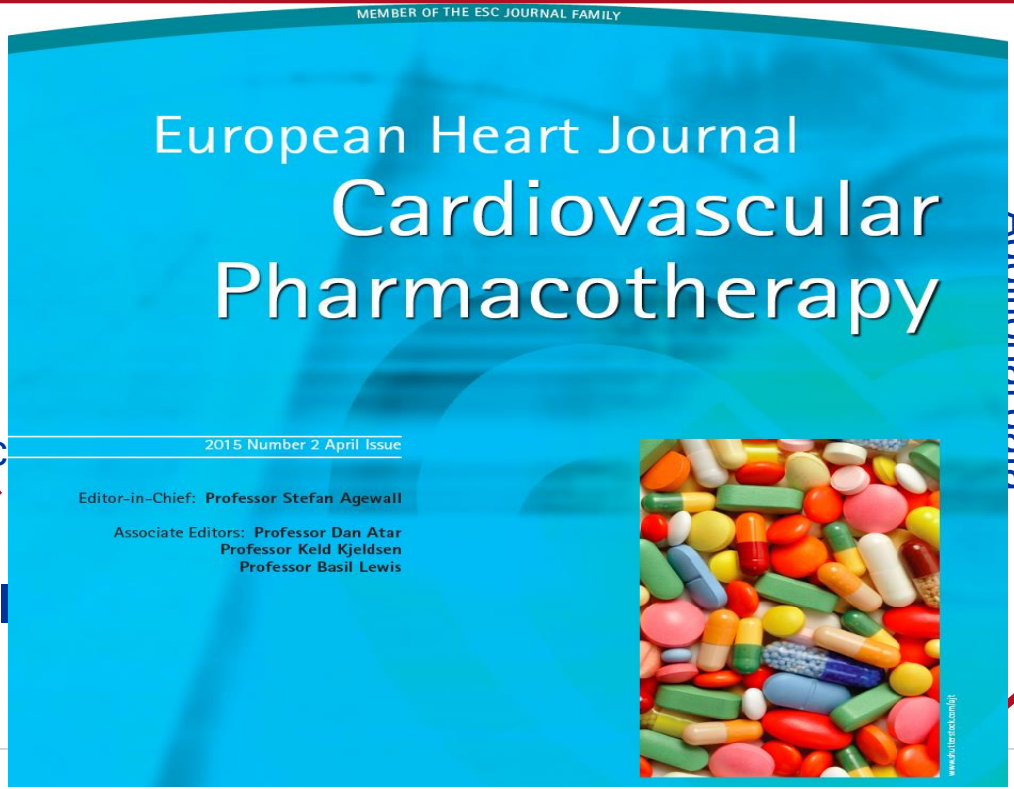
- Select the journal more adequate for your manuscript
- Make it more sexy
- Critically revise the manuscript and add analyses or experiments, additional studies if appropriate
- Use the study as preliminary findings for grant application

Process

Additional data

Rejec

Different journal



Additional data

Different journal

ESC Working Group Cardiovascular Pharmacotherapy

Join the

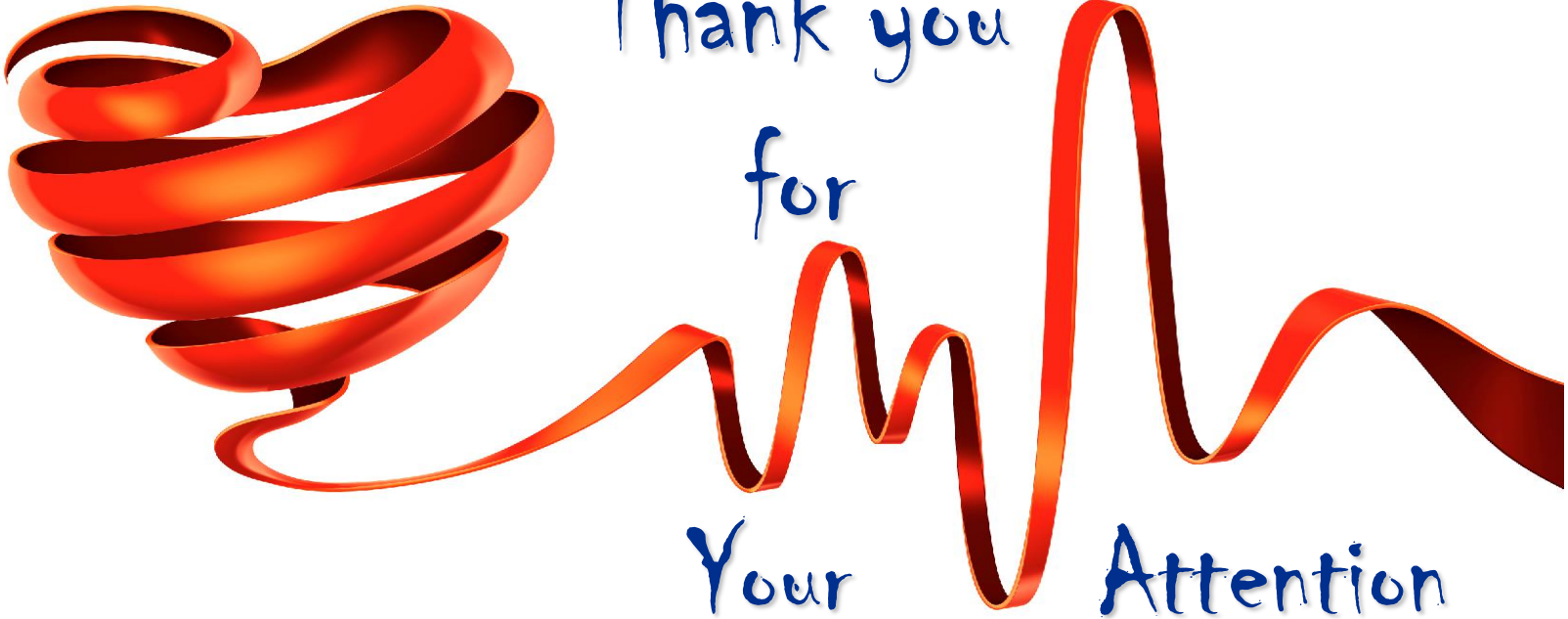
ESC Working Group on Cardiovascular Pharmacotherapy

Membership is free

www.escardio.org/working-groups/Working-Group-on-Cardiovascular-Pharmacotherapy

ESC
Working Group
Cardiovascular
Pharmacotherapy

Diakonhjemmet Hospital



ESC Working Group Cardiovascular Pharmacotherapy