Research design & study execution workshop series

Session 10

NOVEMBER 3, 2015

Quick review of Sessions 1-9

- How to identify a “good” research question
- Common study designs: Pros & cons
- Selecting appropriate study subjects
- Understanding variables types and their measurement
- Nuts and bolts of good data management
- Describing data: statistical and graphical methods

Getting ready to publish your results

You have a great idea

A bunch of stuff happens

Your work gets published

Best case scenario

Some alternate scenarios

- Manuscript is rejected outright
- Manuscript is reviewed, but then rejected
- Manuscript is reviewed, major revisions are requested, but you do not agree with them or you can not fulfill them

… and so on …

How can you maximize your chance of success the first time around?

1. Choose wisely
2. Tell a good story
3. Follow all the rules

1. Choose wisely
2. Tell a good story
3. Follow all the rules

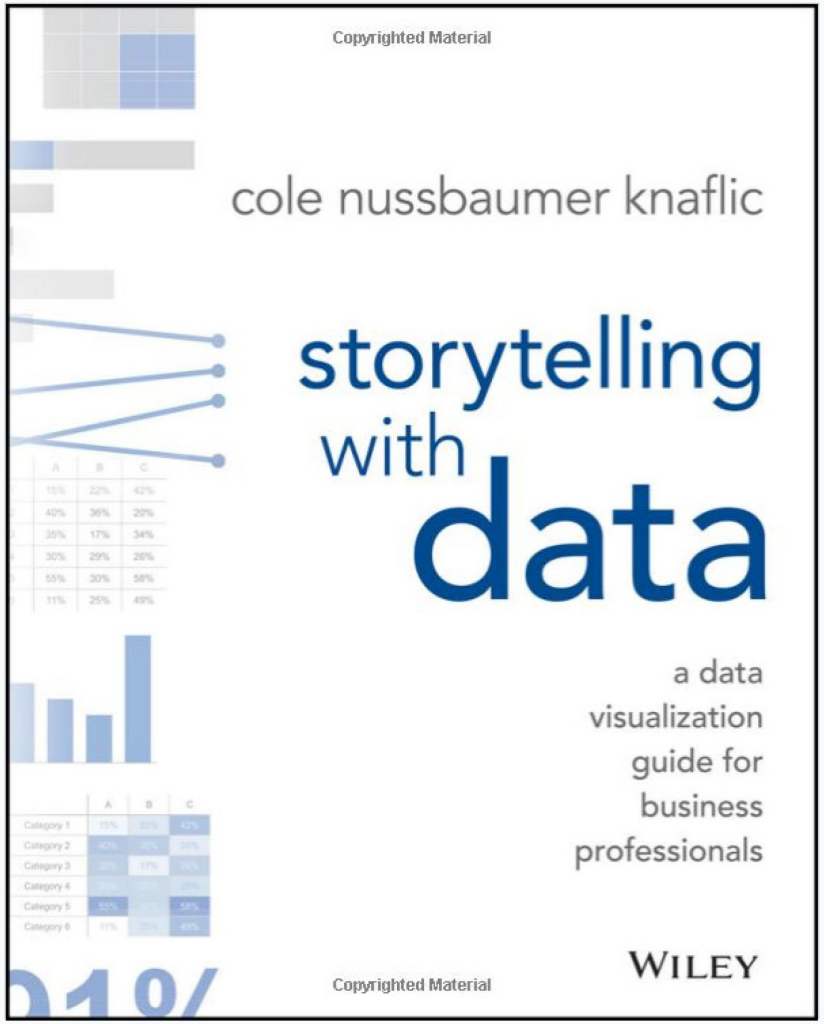
Choose a mentor/partner to help you see things through

Define your audience and choose an appropriate journal for your “story”

1. Choose wisely

2. Tell a good story

3. Follow all the rules



Think about your article as a “story”

All stories have a clear beginning, middle, and end

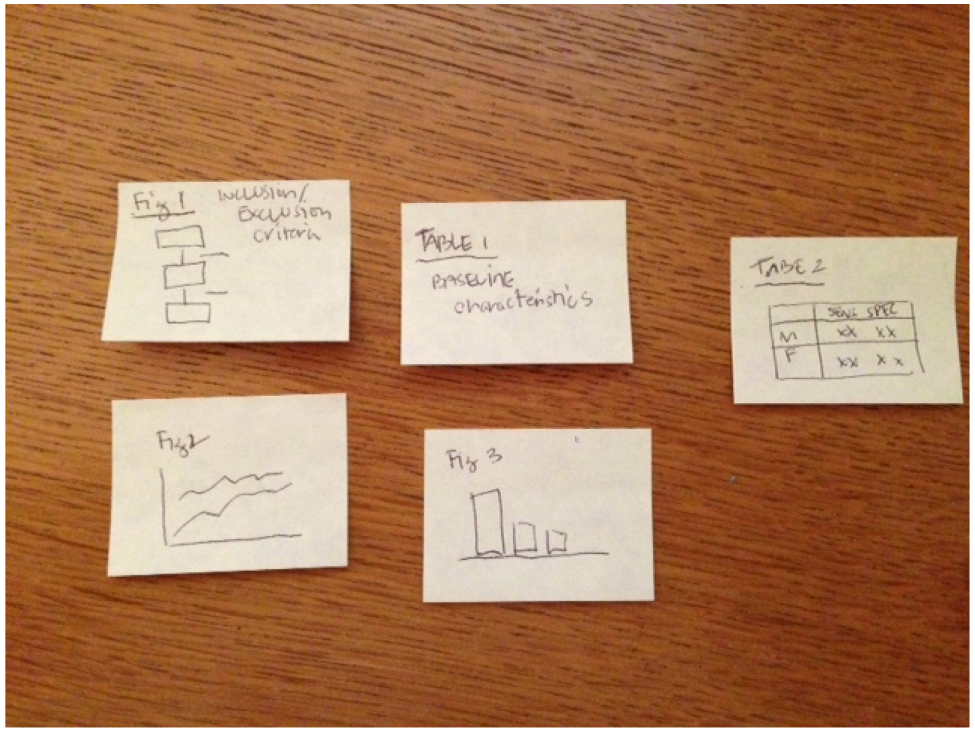
Journal article	Story format
Introduction	**Beginning:** (Plot) Sets the context & introduces the plot. What's the unresolved state of affairs?
Materials and Methods **Results**	**Middle:** (Twists) Describes how to address the problem that was introduced. Explores "what could be". Works to convince the audience why they should trust you and accept your ideas.
Discussion	**End:** (Call to action) Say exactly what you want the audience *to do* with their new understanding or knowledge.

Begin with the end in mind

Must answer your main research question, but you can also do more…

Decide which story you want to highlight

… or you can choose to tell more than one



Draft an outline

Figure 1. Patient flow

Figure 2. Time trends

Table 1. Background characteristics

… and so on…

Sketch out your ‘money shots’

Then, create compelling visuals

1. Choose wisely
2. Tell a good story
3. Follow all the rules

Review recent issues of the target journal for examples (good and bad)

Read the instructions for authors very carefully

Review issue of co-authorship and order of authors

Accountability, responsibility, and credit

Learn from the masters

Get tips on what TO do

Get tips on what NOT to do

Writing It Up: A Step-by-Step Guide to Publication for Beginning Investigators

The secret of getting ahead is getting started.
Attributed to Mark Twain (source unknown)

OBJECTIVE. Writing scientific manuscripts can be unnecessarily daunting, if not paralyzing. This paralysis is usually the result of one of two reasons: either researchers do not know how to start, or they do not know what to put where. However, most radiology manuscripts follow a definable blueprint. In this article, I attempt to lay out the paragraph-by-paragraph development of a typical radiology paper.

CONCLUSION. If authors can accomplish the writing of the 18 paragraphs of text described in this article, they will produce a manuscript that is properly organized, correct in its essentials, and ready for the finishing hand of a seasoned writer and mentor.

Kliewer MA. AJR 2005: 185:591-596.

Sample timeline

- Do background preparation/research
- Write rough draft
- Edit and revise your rough draft
- Incorporate suggestions from coauthors
- Prepare figures/tables/abstract
- Proofread all changes
- Read one last time and then submit

Key sections of the manuscript

- **Abstract**
- **Introduction** (3 paragraphs)
- **Materials and Methods** (5 paragraphs)
- **Results** (4 paragraphs)
- **Discussion** (6 paragraphs)

APPENDIX 1: Paragraph by Paragraph: Content and Order of the 18 Basic Paragraphs in the Typical Radiology Manuscript

Introduction

1. Statement of the issue
2. Why your paper is needed
3. Explicit purpose and hypothesis

Materials and Methods

4. Subjects
5. Procedures and techniques
6. Definitions and criteria
7. Data collection and validation
8. Statistical tests

Results

9. Descriptive statistics and baseline population comparisons
10. Procedural results and sorted outcomes
11. Measures of data validity
12. Results of statistical analyses (same order as in Materials and Methods; often > 1 paragraph)

Discussion

13. Your chief results
14. Your interpretation of your results
15. Your interpretation in the context of the literature
16. Clinical or pathophysiologic implications
17. Limitations
18. Summary and future directions

Finding tips on what NOT to do

Radiology's "Publication information for authors" includes links to items such as:

"Common errors in manuscript preparation"
"Top 10 list of statistical errors"

http://pubs.rsna.org/page/radiology/pia

Developmental Dysplasia of the Hip: Quality of Reporting of Diagnostic Accuracy

Purpose:	To systematically review the quality of diagnostic accuracy reporting in studies on the use of ultrasonography (US) for the diagnosis of developmental dysplasia of the hip (DDH).

Roposch A, et al. Radiology 2006:241(3):854-860.

Conclusion "Overall, there was imperfect reporting of diagnostic accuracy in studies on the use of US for diagnosis of DDH."

Results: Ten studies were included. In three studies, reliability was investigated, and in seven studies elements of both validity and reliability were investigated. In no study did the authors adequately report more than 40% of the STARD items. The quality of methods that were used in the studies was poor. Only one (14%) of seven studies provided information on more than 50% of the QUADAS items. All studies included a good description of image acquisition, but data analysis was imperfect and lacked estimates of diagnostic accuracy and precision. Authors tended to overinterpret their results.

Checklists for reviewers. Make sure to consult these guidelines if you prepare a journal article on diagnostic accuracy.

Keys to success

- Choose wisely
- Tell a good story
- Follow all the rules

And…stick with it until you find a good place to tell your story