Quan’s Pearls for Writing

“A Simple Approach to Writing a Scientific Paper”

Stuart F. Quan, M.D.
Gerald E. McGinnis Professor of Sleep Medicine
Harvard Medical School
Caveats for the Presentation

- Study has been done and data has been analyzed.
- The writing advice relates primarily to clinical research, but some carry over to more basic science studies.
- Doesn’t necessarily apply to Reviews or Case Reports.
- We will be using handouts to supplement the presentation.
Step 1: What are the Key Findings?

• Usually there are 1-4 key findings in the data

• Look for the ones that are unique to the literature
  • i.e., different than what has been done previously
  • A “hook” to make your paper publishable

• Replication studies more difficult, but not impossible to publish
Step 2: Write the Results Section (1)

- Construct the Tables and Figures based in part on Step 1
- Use Figures to emphasize a point that can be easily visualized
  - differences in test scores between groups
  - pathology specimens
  - pictures of gels
- Use Tables to display complex data
  - e.g., epidemiology data usually doesn’t lend reporting in Figures
- For a clinical study, 1st paragraph describes the study population usually referring to a table
  - i.e, “In Table 1 is shown the clinical characteristics of the …”
Step 2: Write the Results Section (2)

- One paragraph per table or figure
  - Paragraph will start with language such as:
    - The results of the logistic regression models predicting obstructive sleep apnea are shown in Table 2.”
  - Do not restate in detail the data in the table or figure
  - Use the text to highlight the important findings only.
    - i.e., “Participants in the control group were older than those who received drug X (mean +/- SD vs. mean +/-SD, p<.001).”

- Not all data has to be in a Figure or Table
  - Some data can be in a text paragraph
  - Do not interpret data in the Results
Step 3: Write the Methods Section (1)

- If a clinical study, can adapt from IRB submission
- 1st paragraph describes the study population
  - If part of a large study, can often reference the larger study’s methods paper
  - May need a participant flow diagram (Consort Diagram)
  - Still need to provide enough information so that reader can understand who was studied and what was done w/o looking up the reference
- Next paragraph is general description of the protocol
- Subsequent paragraphs describe specific procedures or tests
  - May use references
Step 3: Write the Methods Section (2)

- General Rule of Thumb
  - Writing for journal with diverse readership or topic is not well known in the specialty, need more description of specific procedures/tests
  - Writing for subspecialty audience, less description needed

- Last Paragraph: Statistics/Data Analysis
  - How did you handle the data?
  - What statistical tests were used?
  - Complex analyses may require consultation with your biostatistician
Step 4: Write the Introduction

- If clinical study, can adapt from IRB submission
- Purpose of introduction
  - Literature review outlining current state of knowledge including gaps and contradictions
  - Specifies hypotheses and goals of the study
- Two types of Introductions
  - Extensive literature review (used freq by psych journals)
  - Limited literature review with broad statements supported by some references (My favorite)
- Ends with statement of hypothesis or goals of study
Step 5: Write the Discussion (1)

- Is the hardest step for most people
- Quan’s pathway (adapted from Dr. Richard Sobonya, Prof Pathology, U of AZ)
  - 1st paragraph: summarize main findings of study
    - Each finding will be 1 or occasionally 2 sequential paragraphs in the discussion
  - Successive paragraphs start with a restatement of one of the major findings.
    - Subsequent sentences discuss this finding
    - Consistent or dissimilar to previous work
    - Possible explanation or mechanisms
Step 5: Write the Discussion (2)

- Strengths and limitations paragraph follow the major findings
  - Blunt/mitigate limitations after mentioning them if possible
  - Mention strengths after discussion limitations
- Conclusion/Summary paragraph
  - Major “punch lines from the study"
Step 6: Other Sections

- Title Page: Make sure the title describes the major point of the study
- Abstract:
  - Many journals require a structured abstract with defined sections
  - Make sure the abstract contains the key findings of the study
  - Many, if not most people will only read the abstract
- A reference manager program is a must (e.g., End Note or RefWorks)
Final Thoughts

• Not as hard as it seems
• Avoid using identical wording in adjacent sentences
• The thesaurus is your friend
• Do not take rejection personally. Almost any paper can be published if packaged properly and the author perseveres