School of Nursing Research Seminar

Beyond IMRaD
Meeting Readers’ Expectations In Peer-Reviewed Articles

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Who are your readers?

- Scientists
- Busy People
- Competitors
- Clinicians
- Educators
- Patients

Make your case:
Provide readers (reviewers, journal editors) with lots of reasons to “rule in” (rather than “rule out”) your article

IMRaD Structure = Blueprint

<table>
<thead>
<tr>
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Target Journal = Neighborhood (Location)

Example reviewer ratings for “fit”

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable for publication in this journal?</td>
<td>(yes/no)</td>
</tr>
<tr>
<td>Who would be interested in reading this paper?</td>
<td>(fill in the blank)</td>
</tr>
<tr>
<td>Rate the interest of the topic to readers</td>
<td>(very high, very low)</td>
</tr>
<tr>
<td>Rate the appropriateness of topic for this journal</td>
<td>(highly relevant, fairly relevant, tangential, inappropriate)</td>
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</table>
Choosing a Target Journal

- Consider journal features
  - Scope and Audience: Match with your article’s focus and message?

Example: Ethnicity and Disease

Focus: Causal relationships in the etiology of common illnesses through the study of ethnic patterns of disease

Multidisciplinary journal: Epidemiology, genetics, health services, social biology, anthropology

Subscribers: Physicians, medical researchers, other healthcare providers who treat patients and conduct research in the U.S. and abroad.

Example: Pediatric Blood and Cancer

- Basic and clinical investigations of blood disorders and malignant diseases of childhood, including diagnosis, treatment, epidemiology, etiology, biology, and molecular and clinical genetics of these diseases as they affect children, adolescents, and young adults
- Studies on treatment options such as hematopoietic stem cell transplantation, immunology, gene therapy

Annals of Internal Medicine

<table>
<thead>
<tr>
<th>Article Type (length)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Original Research (1500 to 3200 words)</td>
<td>Reports of original research on prevalence, causes, mechanisms, diagnosis, course, treatment, and prevention of disease.</td>
</tr>
<tr>
<td>Research and Reporting Methods (2500 to 4000)</td>
<td>Papers about research methods or reporting standards.</td>
</tr>
<tr>
<td>Reviews: Narrative (3500 to 4000)</td>
<td>Descriptions of cutting-edge and evolving developments, and underlying theory.</td>
</tr>
<tr>
<td>Reviews: Systematic &amp; Meta-Analyses (3500 to 4000)</td>
<td>Reviews that systematically find, select, critique, and synthesize evidence relevant to well-defined questions about diagnosis, prognosis, or therapy.</td>
</tr>
<tr>
<td>Letters: Clinical Observations (600)</td>
<td>Short research or case reports.</td>
</tr>
<tr>
<td>Clinical Guidelines including Synopses (4000)</td>
<td>Summaries of official or consensus positions on issues related to clinical practice, health care delivery or public policy.</td>
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Persuading the Skeptic, Section by Section

1. Introduction
   - Did the authors ask an important research question?

2. Methods
   - Was the study well-designed to answer the question?
   - Was there enough detail to discern quality? Replicate?

3. Results
   - Was useful, credible information acquired to help discern an answer?
   - Was the answer matter? To whom?

4. Discussion and Conclusion
   - What answer do the results provide? Does the answer matter? To whom?

Use of IMRaD format ≠ well-written article

“Scientific papers are not just baskets carrying unconnected facts like the telephone directory; they are instruments of persuasion.”

Scientific papers, even if they are based on sound research, must argue you into believing what they conclude; they must be built on the principles of critical argument” (p. 60).

Research paper as critical argument

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Introduction and Methods = Foundation

Try this at home:

1. Rapidly read the introduction to a published article
2. In 5 minutes or less, create a list of reasons (short bullet points) that the authors provide for why their work is important.

Before you draft your own introduction, ask yourself:

- What important health or educational challenge/opportunity does this work attempt to address? (There could be more than one!)
- What important unanswered question(s) or gap(s) in knowledge does this work attempt to answer?
- Who might be interested in the answer to this question?

Readers (and reviewers) expect that you have...

Introduction Investigated an important (significant) question.

1. Don’t assume readers will “get it.” Instead, directly address need, value, importance of your work by answering questions such as these in the text:

Research article:
- What gap in knowledge does this project fill?
- How will filling this gap move the field forward?

Review article:
- Why is a review needed on this topic? Why now?

Education innovation:
- What is novel about your approach? What educational need does it fill, what challenge does it overcome, or what opportunity does it leverage?

Introduction 2. Be specific in arguing for your project’s significance. LIMA (“little is known about”) is not a sufficient justification!

Example:

To our knowledge, projects studying the use of rapid HIV testing in community outreach settings have not been reported.

This is an important area for research, because many outreach clients:
- Are at high risk for HIV
- Do not access HIV testing through standard venues (clinical settings)
- Are highly mobile, unlikely to return for test results after standard (non-rapid) testing.

AIDS 2006;20:1655–1660

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Introduction 3. Use “funnel” format to organize your significance argument.

Purpose Statement (research question, hypothesis)
Continuity in primary care settings is associated with lots of good outcomes, and ACGME requires a longitudinal continuity experience for IM residents. BUT, continuity is lower in resident continuity clinics, needs to improve. Some evidence that improvements are realized when clinic time is increased and continuity clinics are extended throughout residency. Unknown: Residents’ perceptions of barriers to continuity and solutions to discontinuity. Missed opportunity to learn from them, apply “We present a qualitative analysis of internal medicine residents’ perspectives on factors contributing to discontinuity in ambulatory clinics and potential mechanisms to attenuate these factors.”

Statin Use and Hospitalization for Sepsis in Patients With Chronic Kidney Disease

Sepsis is a major cause of mortality and mortality in patients who have chronic kidney disease and are receiving dialysis. No preventive treatment has been identified. Can statins help? Animal trials suggest “yes.” Limited study in humans. Previous trials were small, observational; one larger, population-based cohort study. “Therefore, our aim was to assess the effect of treatment with statin medications on the rates of sepsis in a prospective cohort study of patients who had chronic kidney disease and were receiving dialysis.”

Example purpose statement for review article:

“We aimed to review the literature on the outcomes of student participation in student-run free clinics using the four levels of learning outcomes as described in Kirkpatrick’s hierarchy, namely: attitudes and motivation; skills and knowledge; behaviour, and patient and health care.”


4. Finish the introduction with a clear, strong purpose statement

- Explicitly signal the purpose, question, hypothesis:
  - The purpose of this study was...
  - This report describes...
  - We tested the hypotheses that...
  - Therefore, our first objective in these studies was...
  - In this study, we sought to extend our initial observations and to specifically test...

Additional Writing Strategies

1. Use “funnel” format to organize.
2. Conclude with strong purpose statement.
3. When describing previous literature,
   - Be selective (brief)
   - Focus on the findings
   - Identify flaws if your work is an improvement
   - The initial studies of the effects of ART on gene expression in HIV-infected persons have been limited in size and duration, and none included longitudinal analyses in persons with AIDS.
4. Draft, then revise after discussion is written.
5. Check for new literature before you submit.
Readers (and reviewers) expect that you have...

1. Investigated an important (significant) question.
2. Approached the question or problem with an appropriate study design and methods.
3. Reported methods and findings in sufficient detail to allow the research to be evaluated (for quality) and replicated.

“Devil is in the details” – but which details are needed?

Take advantage of:
- Reporting guidelines
- Model articles from excellent journals
- Instructions for authors
- http://www.equator-network.org/
- Reporting guidelines: what reviewers expect to see for certain article types or research designs
  - CONSORT – randomized controlled trials
  - STROBE – observational studies
  - PRISMA – systematic reviews, meta-analyses
  - SQUIRE – quality improvement in healthcare
  - CARE – case reports, data from point of care
  - ARRIVE – animal research, reporting in vivo experiments
- Review these before you start a study, and as you develop manuscript

Example: Systematic Review (PRISMA)

- Eligibility criteria for studies: Study characteristics (e.g., length of follow-up) and report characteristics (e.g., language, years considered)
- Information sources: Databases with dates of coverage, date last searched.
- Search protocol: Full electronic search strategy for at least one database, including any limits used, such that it could be repeated
Methods  Additional Writing Strategies

1. When needed, give rationale for study design, methods
2. Include definitions when appropriate
3. Always provide details that emphasize data quality
4. Be consistent, logical with terms, label
   Study Groups:
   - low-fat diet group, high-fat diet group
   - Control (usual care), Treatment (intervention)
   Variables: Aggression or aggressive behavior?
5. Provide a method for every result (and vice versa)
6. Use a logical organization (subheads) – not necessarily chronological
7. Consider using tables, figures for clarity and brevity

Results: Presenting your findings

What readers want to know:

• Data from the experiments conducted, assessments made, participants included, etc. – without judgments, opinions (Just the facts, ma’am).

• Good news: Reporting guidelines focus heavily on readers’ expectations for results sections!

STROBE Statement—checklist of items that should be included in reports of observational studies

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Readers (and reviewers) expect that you have...

Additional Writing Strategies

1. Section organization
   • Typically most important to least important
     – Main question or outcome
     – Secondary aims or outcomes
   • Sometimes chronological
   • Follow order of methods
   • Use descriptive subheads to guide reader
     (if allowed by journal)

2. Paragraph Organization
   • Present general result in first sentence.
     Focus on the overall finding.
   • Then provide explanatory details.
     Subordinate the specific data that
     support the finding.
   • If necessary, add conclusion sentence
     to reinforce overall finding.

Example
JAMA 2004;292(20):2482-2490
The 2 weight loss diets differed ...in
their effect on postprandial glycemia
and insulinemia. Incremental area
under the curves for glucose (mean [SE],
2706 [394] vs 1070 [536] mg/dL per
minute, P = .003) and insulin (5581 [859]
vs 2044 [733] μIU/mL per minute,
P = .003) were more than 2-fold greater
for test meals from the low-fat vs low-
glycemic load diet groups, respectively.

Results

Additional Writing Strategies

3. Redundancy in sentence structure
   and word choice is desirable

Example
American Journal of Medicine 2013; 126(4): 362-365
• When evaluating the 16-hour violations for interns, a statistically
  significant difference was detected with violations occurring in 1% of
  self-report data compared with 4% in parking card data (P = .001).
  This difference amounts to 32 additional 16-hour violations detected
  over the 28-week period.
• When evaluating the 8-hour violations for all postgraduate year
  levels, a statistically significant difference of 1.0% violations in the
  self-report data compared with 3.0% in the parking card data was
  observed (P = .001). This difference amounts to 49 additional 8-hour
  violations detected over the 28-week period.

Introduction vs. Discussion

Present a clear, compelling, concise, and well-
supported argument for:

1. The importance of your
   research idea (the need for, or
   value of, whatever you
   investigated, studied, tested)

2. The importance of your
   specific findings (the value of
   the new knowledge that you
   generated).

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Readers (and reviewers) expect that you have...

- Discussion
- Conclusion

Provided a thoughtful and balanced interpretation of your findings – what they mean, how they might be applied.

**Complicating factors:**

- Answer is unexpected
- Multiple interpretations are possible
- Study limitations: What can you really conclude?

**Discussion “Before you write” Strategies**

1. Read (re-read) the literature as you analyze and interpret your results.
   - Identify relevance to your work
   - Note support for/disagreement with your results
   - Note similarities/differences in design, endpoints, sampling, etc.
   - Get ideas for points covered in discussion sections

2. Identify your main message(s).
   - What’s the headline?
   - Is your “story” verified by your sources” (quality of your data, existing literature)

   ![Texas Heart Institute](http://www.texasheart.org/AboutUs/Depart/SciPubDocuments.cfm)

   - What are the key messages to be conveyed?
     1. _____
     2. _____
     3. _____
   - What is the significance/potential impact on practice or research?
     - Potential clinical benefits:
     - Significant additions to the knowledge base of a particular animal model or mechanistic concept: _____

3. Take your ideas for a test drive.
   - Present your results and discussion ideas at suitable seminars, conferences.
   - Circulate your main message(s) in writing to coauthors, other trusted colleagues for feedback.

**Additional writing strategies**

1. Use “inverted funnel” or pyramid structure
   - Beginning: Answer to research question
     - Generalization from your results, not a repetition of your results

**Summary (Generalization) of Results**

**Example**

“Our results suggest that SRFC participation at the level experienced by students in our study has a protective effect against the declining attitudes towards the underserved that can occur as training progresses.”
**Structuring Your Discussion**

- More detailed interpretation of results in context of existing knowledge
- Middle:
  - Interpret your results
  - Discuss key studies relevant to your work
  - Compare your work to that of others — if discordant, discuss objectively
  - Offer explanation(s) for unexpected findings
  - Briefly describe limitations (and strengths!)

**Interpret your results**

**Example:**

“Although we did not directly assess the impact of specific components of the SRFC student experience on attitudes toward the underserved, we can postulate that in addition to the extended contact with underserved populations that the clinic provides, the experience of working with service-oriented role models may have a positive influence on students.”

**Compare your work to that of others**

**Example:**

“In prior work, Smith and colleagues (2014) documented a significant improvement in medical students’ self-reported attitudes toward the underserved… Our research builds on this work and other valuable shorter-term research by following students for a full two years, and by including not just medical students but also trainees from nursing, pharmacy, physical therapy, public health, and social work programs.”

**Describe Limitations**

**Example:**

Limitations of our study must be acknowledged.

- Survey response rates were low…
- Students were not randomly assigned to the SRFC experience…
- Results …may not be generalizable to other SRFC experiences that differ substantially from our university’s model — for example, those of shorter duration, with different criteria for participation (required vs. optional vs. selective application), and without an emphasis on interprofessional care delivery.

**Structuring Your Discussion**

- More detailed interpretation of results in context of existing knowledge
- Middle:
  - Interpret your results
  - Discuss key studies relevant to your work
  - Compare your work to that of others — if discordant, discuss objectively
  - Offer explanation(s) for unexpected findings
  - Briefly describe limitations (and strengths!)
- Implications, Future work
- End:
  - Strong conclusion
  - Signal the end
  - Discuss implications
  - Suggest future work

**Discussion**

**Additional writing strategies**

2. If you recommend more research, don’t be vague:

Additional research is needed.

*Further studies to confirm these findings would be helpful.*

Instead, make (a few) specific suggestions

**Examples**

“Future research might test long-acting stimulant formulations for other substance-abusing ADHD adult populations, such as those with alcohol or cannabis use disorders.”

“Further examination of the associations observed in this study might be improved by using a more comprehensive set of smoking intensity outcome measures.”
Abstract = Curb Appeal

- Too much background
- No purpose statement
- Missing important details (methods)

- Results don’t match text, tables, figures
- No statement of main conclusion
- Unfounded main conclusion
- Importance of study not clear
- Too many abbreviations