Writing a Scientific Abstract for Research & QI Projects

Worth Publishing

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Research Modules Series
https://www.scs.msu.edu/
AGENDA

Part I-
- The importance & purpose of an abstract
- The elements of an abstract- D-I-S-S-E-C-T-E-D
- Editing tips for writing scientific abstracts
- Abstract rejection and authorship issues

Part II-
- Helpful tips for writing a QI project abstract
An Abstract is Like...
Purpose of a Scientific Abstract

- Meet scholarly requirement & submit abstract to conferences
- Appetizer before reading an entire article or checking a poster/oral presentation
- Summarizes key points or findings & quick way to retrieve info and bridge knowledge gaps
- Time-saving way to quickly explore pertinent research aligned with your project & evaluate quality
# Basic Content of an Abstract

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Problem, gap, significance, purpose/objectives</td>
<td></td>
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</tr>
<tr>
<td>Materials &amp; Methods</td>
<td>Study design, setting, participants</td>
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<tr>
<td>Results</td>
<td>Outcomes/endpoints or measures</td>
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<tr>
<td>Discussion</td>
<td>Conclusion, applications, implications</td>
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</tbody>
</table>

It’s not too complicated!
# Research & QI Abstract Organization

<table>
<thead>
<tr>
<th>IMRAD format</th>
<th>Eight-heading format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>1. Objective: the exact question(s) addressed by the article</td>
</tr>
<tr>
<td>2. Methods</td>
<td>2. Design: the basic design of the study</td>
</tr>
<tr>
<td>3. Results</td>
<td>3. Setting: the location and level of clinical care</td>
</tr>
<tr>
<td>4. Discussion / Conclusions</td>
<td>4. Patients or participants: the manner of selection and number of patients or participations who entered and completed the study</td>
</tr>
<tr>
<td>5. Results</td>
<td>5. Interventions: the exact treatment or intervention, if any</td>
</tr>
<tr>
<td>6. Discussion / Conclusions</td>
<td>6. Main outcome measurement: the primary study outcome measure as planned before data collection began</td>
</tr>
<tr>
<td>7. References, Acknowledgements (Optional)</td>
<td>7. Results: the key findings</td>
</tr>
<tr>
<td></td>
<td>8. Conclusions: key conclusions including direct clinical application</td>
</tr>
</tbody>
</table>

Title

1. Clear; Capitalized, **bold** face font
2. **Hint** to findings
3. Use active voice
4. Include direction of change
5. Avoid abbreviations, acronyms or medical jargon
6. Pique the reader’s interest without being overly cute or gimmicky

“The title & abstract serve as the trailer to the movie...the article”

*Kevin W. Eva*
A Case of Addison’s Disease

Cardiac tamponade preceding adrenal insufficiency—an unusual presentation of Addison’s Disease

Avoid or limit acronyms in Title
Titles with Questions Grab the Reader’s Attention

Does Giving Premature Infants Vitamin D Drops Shorten Their NICU Time?

Elevated Troponin-I — “Nonspecific” Marker of Myocardial Damage?
Examples of Titles

Intermittent Fasting: Potential Bridge of Obesity and Diabetes to Health?
Bo-Ying Zang 1, Li-Xia He 2, Ling Xue 3
Affiliations + expand
PMID: 35267999  PMCID: PMC8912812  DOI: 10.3390/nu14050981

COVID-19 and its long-term sequelae: what do we know in 2023?
Giuseppe Liggi 4, Fabian Sanchez-Gomez 4, Brendan M. Henry 4
DOI: 10.28432/zpmx.16493
Published online: January 29, 2023

The Effect of Advances in Lung-Cancer Treatment on Population Mortality

Association of Aspirin Use for Primary Prevention With Cardiovascular Events and Bleeding Events: A Systematic Review and Meta-analysis
Sean L. Zheng, BM, Bch, MA, MRCPI 1,2,3; Alistair J. Rodrick, BSc 2

Risk of Myocarditis After Sequential Doses of COVID-19 Vaccine and SARS-CoV-2 Infection by Age and Sex
Originally published 22 Aug 2022 | https://doi.org/10.1161/CIRCULATIONAHA.122.069970 | Circulation. 2022;146:743-754
Introduction/Background/Objectives

* Use mainly present tense. 1-3 sentences

State my Research problem or question

Gap; Significance; Relevance

Aim, Objective or Hypothesis

Context
Despite a 90% vaccine efficacy, the COVID-19 vaccination rate among patients with chronic conditions 65 years and older attending the clinic is too low, which puts them at high risk for mortality and morbidity and calls for immediate action. This project seeks to improve the vaccination rate by 30% to prevent potential clinical complications and death associated with COVID-19 infection.
Methods
Be Succinct

Briefly describe general design

Describe methods in chronological order (recipe)
Easy to replicate study
IRB? Regulatory approvals

Include setting, participants, sample size, use of controls, inclusion criteria, endpoints, data analysis plan

Define acronyms. Italicize organism names & Latin terminology such as *E. coli, in vivo, in utero*, etc.
Methods

Indicate any trademarked devices, drugs or reagents, generic names for drugs & companies; software.

Mention briefly interventions & tools. Survey instruments.

Convince readers that they can trust your methods.
Methods:

A total of 232 *H. pylori*-infected, treatment-naive patients were enrolled in this open-label, randomized controlled clinical trial. Patients were randomly allocated into two groups: the 14-day modified dual therapy group and the bismuth-containing quadruple therapy group. Eradication rates, drug-related adverse events, patient compliance, and drug costs were compared between both groups.
Methods: This was a randomized, multicenter, open-label, noninferiority trial. Inpatients with gram-negative bacteremia, who were afebrile and hemodynamically stable for at least 48 hours, were randomized to receive 7 days (intervention) or 14 days (control) of covering antibiotic therapy. Patients with uncontrolled focus of infection were excluded. The primary outcome at 90 days was a composite of all-cause mortality; relapse, suppurative, or distant complications; and readmission or extended hospitalization (>14 days). The noninferiority margin was set at 10%.

Background: Gram-negative bacteremia is a major cause of morbidity and mortality in hospitalized patients. Data to guide the duration of antibiotic therapy are limited.
Mainly **narrative for abstracts;** use graphs or tables if allowed but use them for manuscripts.

Label axes and legends of all tables & graphs

Tables and graphs should be self-interpretable & appealing

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**Figure 2: Distribution of types of eclampsia among the eclamptic patients**

- Antepartum
- Intrapartum
- Postpartum

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Results-II

Present key results in chronological order, consistent with study design/methods

Include statistics with significant or non-significant P (95% CI; P values)
  e.g., risk of bleeding was increased by 38% among X users versus Y users (OR, 1.38; 95% CI, 1.20-1.57, p < 0.001).

Include appropriate units for any numerical data
  e.g., patient had hypoalbuminemia <3gm/dL & leukocytosis > 15,000 cells/mm³
Conclusions/Summary

1. Revisit study objectives

2. Provide a “bottom-line” sentence that summarizes all data related to hypothesis or aim or to the “big picture” (optional)

3. Address any limitations or shortcomings (design or data)

4. Indicate whether further work is needed
References (Optional)

For abstracts: No references are needed; unless indicated in “Instructions for Authors”

Styles in Medicine: AMA, NLM, Vancouver, Chicago

- EndNote
- Zotero
- Mendeley
- AMA Manual of Style
- EXACTLY!
Acknowledgments (Optional)

ACKNOWLEDGE:

Collaborators, pathologists, research associates, statisticians, and others who helped

Company for providing study drugs, reagents or devices, or proprietary materials

Sponsor for funding or grant support
Instructions
For Authors-
IFAs

- Abstracts for manuscripts, conferences or scientific meetings: read instructions & restrictions on # authors, font size, word count, etc.
- STRICTLY adhere to guidelines or risk outright rejection.
- Technical specifications in “Call for Abstracts” or in “Instructions for Authors” on journals’ websites or professional conferences.
Let’s Go Over Some Fun Stuff...Like...

Editing!
Ways to Shorten Abstracts - I

1. **Use active voice**

   Patients were saved by the treatment
   → Treatment saved patients

   Enzyme levels were lowered...
   → Enzyme levels dropped

   A CT scan was ordered by the consultant
   → The consultant ordered a CT scan
Be Active and Write the Way You **TALK!**

© MARK ANDERSON

"The sentence was written in the active voice by the boy. The boy wrote in the passive voice."

"You're just messing with me, aren't you."
More Examples- Passive Into Active

**P:** Educational intervention was offered to patients to quit vaping.
**A:** We offered an educational intervention to patients to quit vaping.

**P:** The patient will be evaluated by the cardiology team for recommendation of therapy.
**A:** The cardiology team will evaluate the patient for therapy recommendation.

**P:** A strong correlation was found between vaping and lung cancer in young adults.
**A:** Vaping strongly correlated with lung cancer in young adults.
In Case of Cause & Effect...

Passive

- Mucosal mast cells in the nasal epithelium are activated by antigens that diffuse across the mucosa after being inhaled.

19 Words

Active

- Inhaled antigens that diffuse across the mucosa activate mucosal mast cells in the nasal epithelium.

15 Words
Using Active Voice... But Passive is Sometimes Inevitable!

**Passive voice is good for Methods section**

Not important to know who carried the tasks or analysis

Active voice improves readability

Active voice reduces ambiguity
- who did what
- cause & effect
- be direct & specific

[Image: IT IS INEVITABLE]
Is it OK to Use Personal Pronouns “I” or “We” in an Abstract or Manuscript?

Yes…unless otherwise specified in conference or manuscript guidelines!
Ways to Shorten Abstracts- II

2. Declutter

Don’t use “empty” constructions or prepositions

- In order to determine: To determine
- In spite of the fact: Even though
- There were 87 patients enrolled in:
  87 patients enrolled in...
- In the month of May: in May
- With the exception of: Except

3. Choose stronger, shorter words:

- In addition to Also
- Not later than By
- It was found We (or they) found
5. **Compare groups in parallel**

- Patients who received therapy had a median life expectancy of 7.0 years, compared to 2.3 years for those who did not receive therapy.  
  
  (23 words)

  Median life expectancy was 7.0 years for treated patients and 2.3 years for untreated patients.  
  
  (15 words)

6. **Put units for lab results - in abstract with word limit, no spacing**

- e.g., creatinine of 2.79 mg/dL
7. Start with “Of” or “Among” when reporting proportions
   - 84 subjects were enrolled in the study and 58 completed it. (11 words)
     
     Among 84 subjects enrolled, 58 completed it. (7 words)

8. Use more descriptive verbs
   - Pfizer reports that approximately only 20% of the young people aged 18-30 got vaccinated before the Delta wave.
     estimates
   - The CDC estimates the number of vaccinated people will double by the end of the year.
     projects
More on Verbs
Verbs drive sentences

9. *Don’t turn verbs into nouns:*

In stroke, *recognition* of early signs and symptoms results in *saving* brain cells and *preventing* nerve damage. (17 words)

It is better is to turn the noun into verbs:

✓ In stroke, *recognizing* early signs and symptoms *saves* brain cells and *prevents* nerve damage. (14 words- *clearer*)
Tips on Writing Good Abstracts - I

1. Use **bold** face fonts to highlight **headings**
2. Ensure sufficient time to compose abstract—at least 5 or 6 hours
3. Adhere to abstract guidelines, format requirements, & deadlines
4. Use **12pt font** or greater to facilitate reading
Tips on Writing Good Abstracts II

Avoid large blocks of uninterrupted text (use paragraphs, indentions, spaces, bold font headings)

Be clear, concise, and brief

Define abbreviations when they first appear within the text. e.g., Lipopolysaccharide (LPS)
“I” & “we”, third person (“the authors”) are ok; limit passive voice

Describe methods & results in the past tense

Discuss conclusions in the present tense

Get feedback from reviewers evaluating your abstract
Tips on Writing Good Abstracts IV

Each section is unified, coherent, concise and able to function independently.

Avoid using unnecessary adverbs, adjectives.

Provide logical connections or transitions between the sentences and info.
Tips on Writing Good Abstracts V

I GET IT

Fully understandable as a stand-alone work

RIGHT ON POINT

Does not offer extra info beyond the scope of the study/project

I UNDERSTAND

Understandable to wide audience - less jargon
Submission Rejection?

"Editor says the manuscript would serve some purpose if it were written on toilet paper."
Leading Reasons Why Abstracts are Rejected

- Incomplete or did not conform to guidelines
- Significant flaws in study design
- Poorly powered; inappropriate statistics
- Lack of regulatory compliance (IRB)
- Study was incomplete (e.g., no data)
- Poorly written
- Study not appropriate for intended audience
- Abstract submitted past submission deadline
Authors & Ethics

Primary author contributes the greatest amount of work & intellectual effort

Primary author - listed first in bold (abstract format)

Max # of authors may be defined by the journal or society

All authors on the abstract are responsible for content and veracity of the work
THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE

The first author
Senior grad student on the project. Made the figures.

The third author
First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is “fair”.

The second-to-last author
Ambitious assistant professor or post-doc who instigated the paper.


The second author
Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

The middle authors
Author names nobody really reads. Reserved for undergrads and technical staff.

The last author
The head honcho. Hasn’t even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

ADD MY NAME AS AUTHOR... OR ELSE...

“No, it’s my wife’s turn to be the first author on your paper.”
Only individuals with substantive contribution to the work should appear as authors.

**Ghost authorships** are not appropriate—authors who meet authorship criteria, but they are not listed.

**Gift or guest authorship** = abuse

Beware of “cut & paste” plagiarism.

Decide in advance authorship & the order of names.
Authorship Issues

What you can do if authorship issues are not resolved:

Author is left off a paper is the most common authorship issue: Declaring contributorship is the best solution.

Each author should take responsibility for a specific part of the work.

European Association of Science Editors
Hello....
You made it here to Part II:

Helpful Tips for Writing a Quality Improvement Project Abstract!

Let's improve...shall we?
The Best Guideline for Writing a QI Project is...

**SQUIRE 2.0**

Standards for **QUality Improvement Reporting Excellence**

https://www.squire-statement.org/
# SQUIRE 2.0 Guidelines for Abstract and Manuscript


## Title and Abstract

1. **Title**  
   - Indicate that the manuscript concerns an initiative to improve healthcare (broadly defined to include the quality, safety, effectiveness, patient-centeredness, timeliness, cost, efficiency, and equity of healthcare).

2. **Abstract**  
   - a. Provide adequate information to aid in searching and indexing.
   - b. Summarize all key information from various sections of the text using the abstract format of the intended publication or a structured summary such as: background, local problem, methods, interventions, results, conclusions.

## Introduction

3. **Problem Description**  
   - Nature and significance of the local problem.

4. **Available Knowledge**  
   - Summary of what is currently known about the problem, including relevant previous studies.

5. **Rationale**  
   - Informal or formal frameworks, models, concepts, and/or theories used to explain the problem, any reasons or assumptions that were used to develop the intervention(s), and reasons why the intervention(s) was expected to work.

6. **Specific Aims**  
   - Purpose of the project and of this report.

## Methods

7. **Context**  
   - Contextual elements considered important at the outset of introducing the intervention(s).

8. **Intervention(s)**  
   - a. Description of the intervention(s) in sufficient detail that others could reproduce it.
Before Thinking About Writing Your QI Project....

Have you checked whether your QI project requires IRB or is exempt?
**Self-Certification Form**

**Determining Whether Your Proposed Activity is Quality Improvement (QI)**

**INSTRUCTIONS:** Complete the following section to help you determine if your proposed activity falls in the realm of QI.

<table>
<thead>
<tr>
<th>QI Certification Statements</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Your activity’s primary objective is to produce an improvement in safety or care that will be sustained over time at the local institution or within a particular program at the local institution. <strong>NOTE:</strong> If the intended outcome is simply to report on what happened at the local institution/program, it does not indicate research design or intent as it may not be generalizable outside of the local institution.</td>
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<tr>
<td>2. Your activity does NOT use a fixed protocol for the duration of the proposed work. <strong>NOTE:</strong> If frequent adjustments are needed, your answer should be “YES.”</td>
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</tr>
<tr>
<td>3. Your activity does NOT involve an intervention that may pose risks greater than those presented by routine clinical care.</td>
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<tr>
<td>4. There will be minimal delays in implementing changes from results.</td>
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<tr>
<td>5. All individuals involved in key project roles have on-going commitment to the improvement of the local care situation.</td>
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<tr>
<td>6. Your activity is NOT funded by an outside organization with commercial interest in the use of the results. <strong>NOTE:</strong> The purpose of this statement is to determine if the project has received funding to be conducted as a research study.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Your activity is NOT part of a multi-center project that involves non-NYUL Health sites. <strong>NOTE:</strong> If it is being conducted in a multi-site context with a common protocol across sites, then the results may be generalizable and thus constitute research.</td>
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</table>

**Understanding Your Results**

If all of your responses to the below statements are positive (i.e., checked off YES), then your proposed activity constitutes QI that does not require IRB review or oversight.

If you answered in any other combination, your proposed activity may be research that involves human subjects. You must submit an application to the IRB before starting your project. Visit the IRB’s website or call for further instructions at 212-263-4110.

If the results of this form indicate the project is not research involving human subjects, consistent with the NYU SOM IRB policy and federal regulations governing human subject research, IRB review is not required.

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1- Consult IRB & fill in a self-certification form to determine if your project is a QI & does not require IRB; another name for the form could be “Determination of Human Subject Research.”

2- Get IRB exempt # for publication.
A Checklist to Evaluate Whether the Project is a QI and Does Not Need IRB Review

The checklist below can be utilized to help determine whether your proposed activity is Clinical Quality Improvement/Measurement that does not need IRB review, or Quality Improvement Research which does require IRB review. Consider consulting the IRB on challenging projects, for example those involving international sites, vulnerable populations, sensitive content, medical errors, or monetary incentives that are not hospital-wide. If necessary, review this checklist with the appropriate Department Chairperson or Administrative Supervisor where your project will be conducted.

PHRC Guidance: Review of Quality Measurement Initiatives
OHRP Quality Improvement Activities FAQs

**If projects meet ALL of the criteria on this list and an editor or publication has concerns about, or disagrees with this statement, the IRB is willing to write in support of your submission, clarifying the IRB policy/approach (contact Elizabeth L. Holmman MD, Director and Chair, Partners Human Research Committee).**
All set...get ready...write!

Follow these QI Abstract Writing Tips
QI Project - Background

- Explain importance of the project
- Ground reader about magnitude of problem
- Mention national or state benchmarks or best practice guidelines for an outcome measure
- Include current implications & overarching goal (e.g., better clinical outcomes, better process, less waste, cutting costs, better patient satisfaction).
QI Project - Aim

- **Objectives:** The project objectives must be clear, precise, and concise
- The SMART aim statement.

![SMART Goals Diagram](image-url)
QI Project - Methods

- **QI Approach:** PDSA, Clinical Practice Improvement, Root Cause Analysis, Model for Improvement, Lean, Six Sigma...etc.?
- Provide a roadmap to your work; others can replicate it
- Discuss QI tools or techniques
- Discuss PLAN (PDSA) in detail
- Root Cause Analysis (RCA)? Mention it here & under “results”
QI Project - Results

- Report results that show difference & impact
- Before & after intervention results
- Report data source: data registry, surveys...

Specify:
- Outcome measure, sample size, rate of X or % change
- Stats or QI tool (e.g., Fishbone, Pareto chart, control chart...)
QI Project- Conclusion

- Are implications clearly described? Aligned to results?
- Discuss lessons learned
- Relate conclusion to aim statement & summarize what you have done so far
- Display strengths & solutions provided
- Mention limitations & next steps
Last Tips on Writing a QI Project Abstract

Read abstracts from other QI projects from the literature or conferences to familiarize yourself with the write-up.

Start writing your draft & put in everything (raw draft), then edit.

Let others read your draft (preferably someone outside the project) and get their feedback.
More References

- [https://scientificwritingtips.wordpress.com/the-cartoons/](https://scientificwritingtips.wordpress.com/the-cartoons/)
- Ogrinc G, Mooney SE, Estrada C, et al
- The SQUIRE (Standards for QUality Improvement Reporting Excellence) guidelines for quality improvement reporting: explanation and elaboration
- *BMJ Quality & Safety* 2008;17:i13-i32. [https://qualitysafety.bmj.com/content/17/Suppl_1/i13](https://qualitysafety.bmj.com/content/17/Suppl_1/i13)
Let’s Draw a Smile…and Recap

Courtesy of: https://scientificwritingtips.wordpress.com/the-cartoons/
Fun Cartoons on Scientific Writing

Tip 1 - How to get started: choose the optimal environment!
Tip 2 - Title and abstract: sell your paper!
Tip 3 - Introduction: work on that funnel shape!
Tip 4 - Methods: provide a cookbook with the study’s ingredients!
Tip 5 - Results: present findings without interpretation!
Tip 6 - Discussion: be frank in acknowledging limitations!
Tip 7 - Tables and figures: make them self-explanatory!
Tip 8 - References: always go back to the original source!
Tip 9 Authorship: discuss it within the team!
Tip 10 - Choice of journal: define a list of target journals!
Tip 11 - Submitting a paper: write a convincing cover letter!
Tip 12 - Responding to reviewers: don't get frustrated!
Submit your abstract to Research Day and your manuscript to SMRJ!

Need Help?

Dr. Ismail
ismailr1@msu.edu

SCS Website:
https://www.scs.msu.edu/

Currently NOT accepting case reports