WRITING A SCIENTIFIC ABSTRACT

Scientific Abstract Essentials

The most common abstracts you will write will be those for research articles or for submission to a scientific conference. Depending on the requirements of the journal or conference, the abstract can be presented as separate sections with headings (a structured abstract) or as a single paragraph. Journals and conferences generally also define a word limit for abstracts, usually in the 200- to 300-word range. Consult the journal or conference guidance for the specific word limit and the prescribed abstract formatting. Consulting published examples is also helpful.

Key Components of a Scientific Abstract

Regardless of whether an abstract is presented as a structured abstract or a single paragraph, a high-quality abstract includes the following key components—**Background**, **Methods**, **Results**, and **Conclusions** (the wording of headings in a structured abstract may vary).

Background

Here, describe the broader scientific context and the problem or question the study addressed. This section is usually the shortest section of an abstract and should briefly outline the following information:

1. What do we already know about the subject of your study?
2. What is not known about the subject that is the basis of the work you are describing (the knowledge gap), and thus, what is examined in your study?
3. If your research is hypothesis-driven, what is the hypothesis you were testing?

Most background sections can be presented in 2 or 3 lines, with some taking only 1 line. Remember, the more words you use to describe the background, the fewer you have to present your findings.

Methods

Here, briefly describe the study design and research approach. The methods section is usually the second-longest section of an abstract. It should contain enough detail to allow the reader to understand what you did in your study and how. What you include depends on what kind of study you are presenting. For clinical studies, for example, include the following types of information:

1. What was the study design?
2. What was the medical condition for which the study participants were recruited?
3. What was the sample size of the overall study population and of various experimental groups?
4. What was the study population’s age range?
5. How were the different groups treated?
6. What was the duration of the study?
7. What was the primary outcome, and how was it measured?

There is no need to give details about statistical methods or the software used unless there is a specific reason your reader should know this information.

Results

Here, summarize the major findings or trends. The results section of your abstract will, most likely, be the longest section. This section should contain the following types of information:

1. Present the key findings of your study, not a data dump.
2. If you tested a hypothesis, be sure to state whether your results support or refute the hypothesis.
3. If you are reporting a clinical study, state the number of participants who completed the study for various treatment arms.
4. There is no need to include extra details about statistical comparisons, such as the type of test or degrees of freedom. A *P* value is sufficient.
5. When stating differences between groups, be sure to state the direction of the difference. Do not say, “Response rates differed between the control and treated groups.” Instead, say something like, “The response rate of the treated group (62%) was significantly greater than the response rate of the control group (25%; $P<0.01$).”
6. For clinical studies, in addition to reporting efficacy, you should report any important adverse events.

Conclusions

Here, state the significance and implications of the results for the field. The conclusions should frame the take-home message of your work. It should highlight the primary outcomes and any unexpected findings. In this section, you can also express your interpretation of the importance of the findings, but do not overgeneralize or overstate the impact of your findings.

Journal Abstracts

Purpose

- ***First impression.*** The journal abstract helps set the tone and establishes the quality of the research. It communicates the author’s clarity of thought and precision, which is crucial for establishing credibility in the scientific community.
- ***Rapid understanding.*** An abstract provides a complete, high-level overview of the entire article, including its purpose, methodology, key findings, and conclusions. This overview helps readers grasp the essence of the work without having to read the whole document.
- ***Time efficiency.*** Researchers must sift through thousands of articles to find those relevant to their research. By reading an abstract, a researcher can decide whether to read the full article, saving valuable time and focusing their efforts on the most pertinent articles.
- ***Indexing and discovery.*** Online databases, such as PubMed and Google Scholar, use abstracts and the keywords they contain to index research. An effective abstract ensures an article is easily discoverable by others in the field who are searching for related topics.
- ***Initial screening.*** Journal editors use abstracts for the initial screening of submissions. A weak abstract can cause a manuscript to be rejected before it even reaches peer review.
- ***Dissemination and impact.*** A compelling abstract is often the first, and sometimes only, part of an article that potential readers will see. An effective abstract can entice readers, leading to more views, citations, and a greater overall impact of the research.

Overall Considerations

- A well-written abstract contains as much detail as is possible within the prescribed word limit, which requires precise writing and good judgment about what to present and what to leave out.
- If a journal allows abbreviations in the abstract, they should be defined on first usage, for example: “Multiple myeloma (MM) is a hematologic malignancy with high morbidity and mortality rates. Adipokines, cytokines, chemokines, and genetic variation all play a role in the development and progression of MM.”
- Ensure that any data or concepts presented in the abstract also appear in the article text.

Conference Abstracts

Purpose

- ***Initial screening.*** A conference abstract helps the conference committee assess the suitability and rigor of a proposed presentation.
- ***Information and overview.*** Your abstract, if accepted, also provides background information for conference attendees and offers a concise overview of complex research or innovations.
- ***Dissemination and career advancement.*** A well-crafted abstract is crucial for summarizing research, securing oral presentations, and enhancing networking opportunities at conferences.

Overall Considerations

- Keep the title clear and concise, reflecting the conference’s themes. Avoid overly clever titles that obscure the content.
- Likewise, target your abstract to the appropriate conference by aligning it with the conference’s themes and objectives.
- Decide on the presentation format (e.g., oral or poster) early, considering the level of audience interaction desired.
- Review submission guidelines carefully, including deadlines.
- Ensure your abstract follows guidelines for font size and specified word limit.
- Seek feedback from colleagues to enhance clarity and coherence.

Submission Process and Review

- After submission, abstracts are reviewed by experts who assess their relevance and quality based on predetermined criteria.
- Abstracts are evaluated based on novelty, significance, and clarity, influencing selection for oral presentations and awards.
- Feedback from reviewers can provide valuable insights for future submissions, even if the abstract is rejected.

Final Considerations

- Follow the outlined guidelines to increase the likelihood that your abstract will be accepted.

- Ensure proper formatting and proofreading to avoid errors that could detract from the abstract's quality.
- A well-written abstract serves as an advertisement for your work, attracting interest and potential collaborations at conferences.

Authorship

It is a fundamental ethical and practical requirement for all authors to review and approve the final version of their manuscript or conference abstract before submission. Although the first/corresponding author often manages the submission process, all authors should be involved during the final stages of proofreading and revision to ensure accuracy, completeness, and agreement on content.

Examples

See below for examples of published abstracts.

Structured abstract with the basic section headings.

Akuta S, Hirano Y, Ishiyama Y, et al. Short-Term Outcomes of Robotic-Assisted Sigmoidectomy Using the Senhance Digital Laparoscopy System: A Comparison With Laparoscopic Surgery Using Propensity Score Matching. *Am. Surg.* Published online January 2026. doi: 10.1177/00031348261415617

Background

Colorectal cancer is a common and deadly form of cancer. Sigmoid colon cancer is the most prevalent type of colon cancer. Robotic-assisted surgical systems, like the Senhance Digital Laparoscopy System, have attracted considerable attention in recent years. The purpose of this study was to confirm the non-inferiority of Senhance-assisted surgery regarding its short-term safety compared with conventional laparoscopic surgery for sigmoid colon cancer.

Methods

This retrospective single-center study analyzed data from patients undergoing a sigmoidectomy between March 2020 and 2025. Propensity score matching was employed to create comparable groups. Patient characteristics, short-term surgical outcomes, and pathological data were assessed. Postoperative complications were graded using the Clavien-Dindo system.

Results

Prior to propensity score matching, there were differences in cancer stage between groups. After matching, two groups comprising 45 patients each were comparable across various factors. The operative time was significantly longer in the Senhance-assisted group compared with the conventional laparoscopic surgery group (236 min vs 204 min, P = .001), underscoring the importance of optimizing surgical techniques. Postoperative Numerical Rating Scale pain scores were significantly lower in the Senhance-assisted group on day 1 (3 [1-5] vs 4 [2-6], P = .03) and day 3 (2 [0-4] vs 3 [2-5], P = .02). However, no there were no significant differences in blood loss, complications, or pathological characteristics between the groups.

Conclusions

This study demonstrated that Senhance-assisted sigmoidectomy was non-inferior to conventional laparoscopic surgery in terms of short-term safety outcomes.

Structured abstract that deviates from the basic headings.

Abdel Jawad M, Spertus JA, Ikeaba U, et al. Early Adoption of Sodium-Glucose Cotransporter-2 Inhibitor in Patients Hospitalized With Heart Failure With Mildly Reduced or Preserved Ejection Fraction. *JAMA Cardiol.* 2025;10(1):89-94. PMID: 39556474

Importance: Sodium-glucose cotransporter-2 inhibitors (SGLT2is) are the first therapy shown to improve clinical outcomes for patients with heart failure (HF) and a left ventricular ejection fraction (LVEF) greater than 40%. Nationwide adoption of SGLT2is in the US since publication of the Empagliflozin Outcome Trial in Patients With Chronic Heart Failure With Preserved Ejection Fraction (EMPEROR-Preserved) in August 2021 is unknown.

Objective: To examine trends and hospital-level variation in SGLT2i adoption.

Design, setting, and participants: This cohort study included patients with LVEF greater than 40% who were hospitalized for decompensated HF at 1 of 557 sites in the US between July 1, 2021, and September 30, 2023, from the Get With The Guidelines-Heart Failure registry.

Main outcomes and measures: Patient-level trends and site-level variation in prescription rates of SGLT2i at hospital discharge. Site-level variation was quantified using the median odds ratio, which describes the average odds that a patient being treated at one vs another randomly selected hospital would receive SGLT2i therapy at discharge.

Results: Of 158 849 patients (median [IQR] age, 76 [66-85] years; 89 816 females [56.5%]), 22 126 eligible patients (13.9%) with HF and an LVEF greater than 40% were prescribed an SGLT2i at hospital discharge. Quarterly prescription rates increased from 4.2% in July to September 2021 to 23.5% in July to September 2023 (P for trend < .001). SGLT2i prescription was more likely among patients with HF with mildly reduced LVEF (41%-49%) than in those with preserved LVEF (≥50%; 5127 of 27 712 patients [18.5%] vs 16 999 of 131 137 patients [13.0%]; absolute standardized difference, 16.7%). After adjustment for patient characteristics, there was a high variance between hospitals in the rate of SGLT2i prescription (median odds ratio, 2.12; 95% CI, 2.02-2.25). Among 518 hospitals with 10 or more eligible discharges, 11 hospitals (2.1%) discharged 50% or more of their patients with an SGLT2i prescription, while 232 (44.8%) discharged fewer than 10% of eligible patients with an SGLT2i prescription.

Conclusion and relevance: For patients with HF and an LVEF greater than 40%, discharge prescription of SGLT2is increased from 4.2% to 23.5% during the first 2 years after the EMPEROR-Preserved trial demonstrating treatment benefits; however, these rates varied across US hospitals.

Single-paragraph abstract.

Graham SE, Clarke SL, Wu KH, et al. The power of genetic diversity in genome-wide association studies of lipids. *Nature*. Dec 2021;600(7890):675-679. doi: 10.1038/s41586-021-04064-3.

Increased blood lipid levels are heritable risk factors of cardiovascular disease with varied prevalence worldwide owing to different dietary patterns and medication use. Despite advances in prevention and treatment, in particular through reducing low-density lipoprotein cholesterol levels, heart disease remains the leading cause of death worldwide. Genome-wide association studies (GWAS) of blood lipid levels have led to important biological and clinical insights, as well as new drug targets, for cardiovascular disease. However, most previous GWAS have been conducted in European ancestry populations and may have missed genetic variants that contribute to lipid-level variation in other ancestry groups. These include differences in allele frequencies, effect sizes and linkage-disequilibrium pattern. Here we conduct a multi-ancestry, genome-wide genetic discovery meta-analysis of lipid levels in approximately 1.65 million individuals, including 350,000 of non-European ancestries. We quantify the gain in studying non-European ancestries and provide evidence to support the expansion of recruitment of additional ancestries, even with relatively small sample sizes. We find that increasing diversity rather than studying additional individuals of European ancestry results in substantial improvements in fine-mapping functional variants and portability of polygenic prediction (evaluated in approximately 295,000 individuals from 7 ancestry groupings). Modest gains in the number of discovered loci and ancestry-specific variants were also achieved. As GWAS expand emphasis beyond the identification of genes and fundamental biology towards the use of genetic variants for preventive and precision medicine, we anticipate that increased diversity of participants will lead to more accurate and equitable application of polygenic scores in clinical practice.

References

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