Writing Effective Abstracts: A Guide for Medical Students

By the ACS Committee on Medical Student Education (CMSE) Medical Student Task Force:
Alice Zhou, Sofia Sirocchi, Taylor Nunes, Brendan Rosamond, Deepak Lakshmipathy, Kassandra Carrillo, Haley Kenner, Kevin Gianaris, Tommy Boland

INTRODUCTION

Abstracts are **concise summaries of original research** that include essential information about the **study's purpose, methodology, results, and conclusions**. Abstracts are typically **submitted for consideration for presentation in oral or poster format** at academic conferences. In addition to appearing at the beginning of manuscripts, **abstracts alone may be published in conference handbooks or an affiliated journal**, depending on the specific guidelines of the conference.

SCOPE OF ABSTRACTS

Check the abstract guidelines for information on the **types of studies and topics** that are typically appropriate for the conference. Most conferences will allow for **original research**, while some will also allow for **case reports, surgical techniques, surgical education, literature reviews, and meta-analyses.** Be sure to follow these guidelines closely, as abstracts outside this scope will not be accepted.

UNDERSTANDING ABSTRACT GUIDELINES

Prior to beginning your abstract submission, be sure to read through the **specific abstract guidelines for your conference**. Keep in mind the following when reading through the guidelines:

☑ Submission Requirements

The abstract guidelines will provide information on the submission deadline, the submission portal, and the process for uploading any other required information. In addition to the abstract, some conferences may require additional statements on the impact of the work. As you read through the guidelines, make sure you are aware of the file type required for submission (PDF vs. Microsoft Word vs. online form) and any other formatting requirements (ie. font sizes). When considering the submission deadline, be sure to note the time zone stated.

☑ Word Limit

Most abstracts are required to be concise, typically ranging from 250 to 500 words, but specific limits should be confirmed as they can vary. Some abstracts will have word limits, while others will have character limits. Be aware that the word or character counter in the online portal may differ when you transfer over your text.

☑ Author Limit

Guidelines might specify a maximum number of authors allowed per abstract or define criteria for who qualifies as an author based on their contribution to the work. Many conferences also require the first author or the principal investigator (PI) to submit a work for consideration. Check if they have any guidelines about this or if any member of the group can submit the abstract. For single-author abstracts, check to see if the conference requires a PI sponsor for submission.

☑ Author Disclosures

You will likely be required to disclose any potential conflicts of interest from all the authors. This can include financial disclosures, affiliations, or other interests that could influence the research. Check ahead of time whether one author can submit disclosures on behalf of all co-authors, or whether each co-author needs to separately submit disclosures. In the case of the latter, authors should allot more time for each co-author to fill out their disclosures.

☑ Tables and Figures

·Tables and/or figures are typically able to be included with the submission. Be sure to check the specifics on how many of each can be included and how they should be formatted (PNG, JPEG, etc.) for the submission and whether or not the words in the tables count towards the overall abstract word limit (see above).

☑ Number of Submissions

Many conferences will have a limit on how many abstract submissions are allowed per author or PI. If you are planning on submitting multiple abstracts to the same conference, check to see if this is allowed.

☑ Previously Presented Work

A few conferences will let you submit a project that has already been published in journal and/or presented at another conference. Typically, the abstract guidelines will outline these requirements, but if not, you can reach out to the organization to verify. If your project has previously been presented at another conference, and you are submitting it to be presented again, it is important to check with both conference organizations. Sometimes, guidelines prohibit you from presenting the project at another conference after the fact.

☑ Journal Requirements

Some conferences require that a manuscript be submitted to a specific journal if the abstract is accepted for presentation. Be sure to check the abstracts guidelines for any such requirements ahead of time, as well as any deadlines for manuscript submission, so that your team is aware prior to abstract submission. Significant penalties can be given if you do not submit the manuscript to the correct journal.

☑ Changes Post-submission

Some submission portals allow for changes post-submission, while others do not. Most conferences will list on their website or in the submission portal whether changes to the abstract may be made after submission, but if it is unclear, you can reach out to the conference to ask. As a conservative measure, plan to use the final version of your abstract as the one you submit.

STRUCTURING ABSTRACTS

Each abstract submission has **specific guidelines** on what **sections** to include and how many **tables/figures** are allowed. **Be sure to read those guidelines before you begin writing.** If you're submitting a different type of abstract (ie. literature reviews, case reports, history), formats may differ. If you don't know where to start, you can look at past examples of accepted abstracts. Typical sections for original research abstracts include the following:

TITLE

The title should succinctly convey the essence of the abstract. It needs to be specific enough to give a clear idea of the study but generally should not convey the findings or conclusions of the study.

BACKGROUND

This section sets the stage for your study by providing context. It should briefly explain what is already known and identify a gap in literature that your study aims to fill. The specific aims or hypotheses of your study may be included in this section. The background section should ideally be less than three sentences long.

METHODS

This part of the abstract describes how you conducted your study. Be sure to include elements such as study design (e.g. randomized controlled trials, case-control studies, cohort studies, etc.), brief inclusion and exclusion criteria, exposures or interventions assessed, outcomes of interest, and main statistical tests utilized. In describing inclusion criteria, provide specifics on the data source used and the time period included. For literature reviews, be sure to also include the utilized database(s), and the specific search terms used to interrogate the literature.

RESULTS

Here, you present the findings of your study without interpretation. This section should be factual and based on your data. Key elements to include are baseline characteristics of the cohort(s), primary outcomes, secondary outcomes, and/or sensitivity analyses. Present specific findings, such as medians, means, percentages, p-values, and confidence intervals, rather than just describing the results. If a table or figure is included, reference them here in this section.

DISCUSSION

Sometimes, a discussion is required instead of or in addition to the conclusion. The discussion should include a more in-depth analysis, interpreting and explaining the significance of the results, especially in the context of existing research. It should further discuss potential limitations of the study and suggest avenues for future research. Compared to the conclusion, the discussion is more detailed and interpretive, analyzing the results in the context of the field.

CONCLUSION

The conclusion provides a concise summary of the key findings, restates the main points, and emphasizes the broader significance or implications. In general, the conclusion should be a short, simplified summary of the study's key takeaways and their importance.

TABLE/FIGURE

If allowed, incorporating figures and tables can greatly enhance clarity and conciseness, particularly when presenting complex data or detailed results. Use this to your advantage; while key elements of your table/figures can be highlighted in your abstract text, avoid overlap between data in the text and data in tables.

POST-SUBMISSION TIMELINE

After submission, **email a final copy of the abstract to all co-authors along with the submission confirmation** so that everyone has verification of the submission. **Expect to hear back a few months later** about whether your abstract was accepted for presentation. Most will inform you if your abstract was rejected but some may not. Notifications will often only go to the submitting author. If you are the submitting author, **be sure to notify all co-authors of any abstract decisions.** If your abstract is accepted for presentation, you will typically have a few months to prepare your poster or slides, as well as the manuscript if required.

FINAL TIPS

- Start early and allow time for co-authors to review your abstract. You should aim to have a draft of your abstract ready for review around at least two weeks prior to the submission deadline. This allows time for co-authors to provide feedback and for you to incorporate the feedback in subsequent versions of the abstract.
- Keep your work organized. Document any changes made to the methodology or analyses while writing and revising your abstract. It can be helpful to document version changes of your abstract as you revise based on co-author feedback. Careful and organized documentation will make your life much easier when it comes to putting together the manuscript or presentation. Make sure the final submitted version is a clean copy with no tracked changes or comments.
- If you are working with a group of people on an abstract, it can be helpful to have a shared folder (e.g. on google drive, one drive, etc.) where all documents related to the project can be stored all in one place to avoid versioning issues.
- Emphasize the novelty and relevance of your work. Often, abstracts chosen for presentation are ones that will generate good discussion at the conference.
- Consider using active voice where appropriate.
- If your abstract is accepted for presentation but you can no longer present, reach out before you agree to present to inquire about another author presenting on your behalf. Some conferences will allow this, while others may not.
- If you have any questions, don't be afraid to reach out to the point of contact.

Most importantly, if your abstract isn't accepted, **don't lose confidence** - many impactful studies in the literature have been initially rejected. Conferences often have specific focuses, or there may have been other similar submissions that year. **Reflect on your work, ask for any constructive feedback from the reviewers, and try again somewhere else!**

EXAMPLE ABSTRACT #1

Use of Machine Perfusion for Liver Transplantation: The National Experience

Alice L. Zhou, MS[1], Armaan F. Akbar, BS[1], Jessica M. Ruck, MD PhD[1], Sharon R. Weeks, MD,[1] Russell Wesson, MBChB[1], Shane E. Ottmann, MD[1], Benjamin Philosophe, MD PhD[1], Andrew M. Cameron, MD PhD[1], Raphael P.H. Meier, MD PhD[2], Elizabeth A. King, MD PhD[1]

(1) Division of Transplant Surgery, Department of Surgery, Johns Hopkins Hospital

(2) Department of Surgery, University of Maryland School of Medicine

Background: Machine perfusion for liver transplantation has become more widespread in the United States, but national studies on this growing practice are lacking. We investigated national use and outcomes of machine perfusion for liver transplantation.

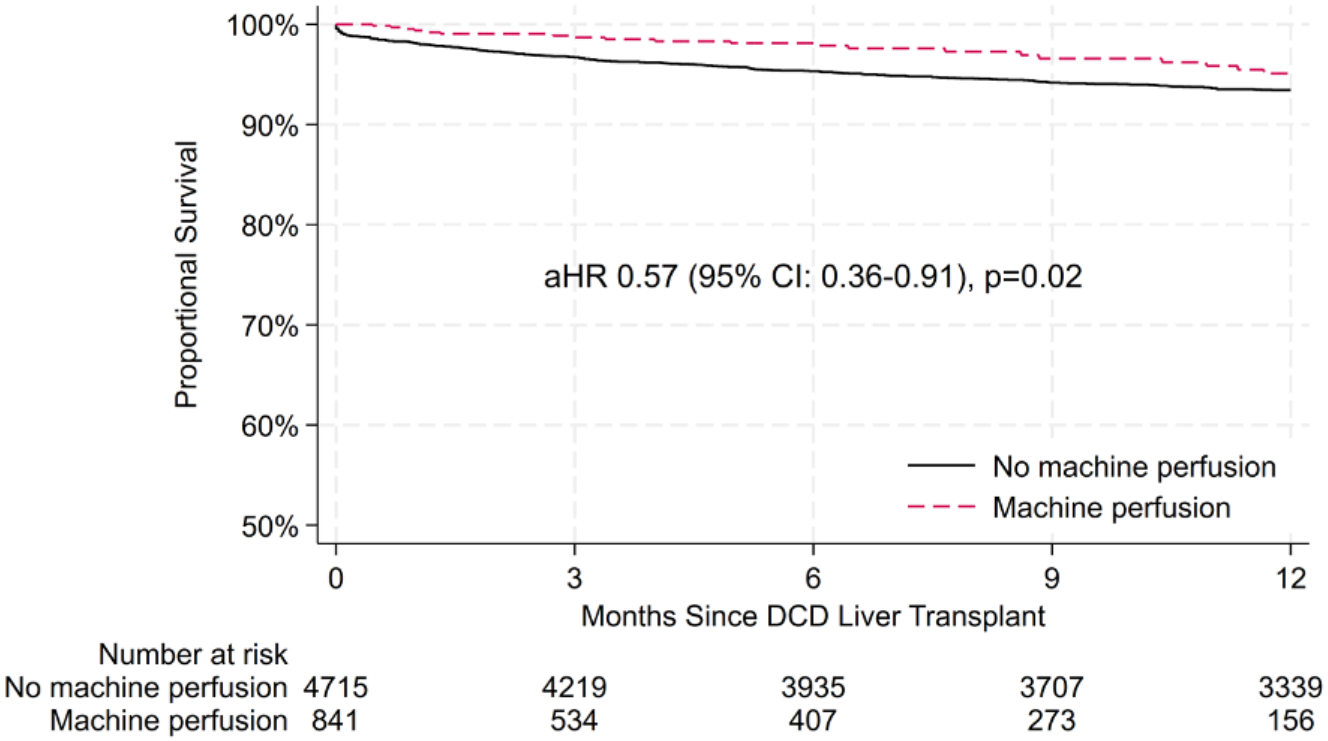
Methods: Adult (≥18 years) liver recipients transplanted between 01/01/2016 and 09/30/2023 in the United Network for Organ Sharing database were included. We used multivariable Cox regression to compare 1-year post-transplant recipient survival and all-cause graft failure by use of MP and performed subgroup analyses among circulatory death (DCD) and brain death (DBD) donors.

Results: Of 52,626 deceased donors with liver recovery, 1,799 (3.5%) utilized machine perfusion. The proportion of all liver transplants using machine perfusion increased from 0.3% in 2016 to 15.5% in 2023 (p<0.001). Machine perfusion for DCD transplants increased from 0.8% in 2016 to 50.0% in 2023 (p<0.001). Donors of machine perfusion grafts were older (47 [34-57] vs. 42 [29-55] years, p<0.001), had higher body mass indexes (28.3 [24.4-33.3] vs. 27.3 [23.7-31.8] kg/m^2, p<0.001), and were more likely to be DCD (47.1% vs. 9.3%, p<0.001). Among DBD transplants, machine perfusion and non-machine perfusion DBD transplants had similar survival (93.2% vs. 93.6%; aHR 0.99 [95% CI: 0.74-1.37], p=0.97) and all-cause graft failure (9.3% vs. 7.9%; aHR 1.12 [95% CI: 0.87-1.43], p=0.38) out to 1 year. Among DCD transplants, machine perfusion recipients had increased survival (95.1% vs. 93.4%; aHR 0.57 [95% CI: 0.36-0.91], p=0.02; Figure) and decreased risk for all-cause graft failure (7.6% vs. 11.0%; aHR 0.50 [95% CI: 0.35-0.70], p<0.001) out to 1 year.

Conclusions: Machine perfusion use in liver transplantation is rapidly expanding and is associated with favorable outcomes compared to cold storage. Machine perfusion is associated with increased post-transplant survival for DCD transplants, highlighting the potential for machine perfusion to expand utilization of DCD grafts.

EXAMPLE ABSTRACT #1 (cont.)

Figure. Unadjusted 1-year Kaplan Meier recipient survival curve for donation after circulatory death liver transplants that did versus did not utilize machine perfusion in the United States, 2016-2023.



EXAMPLE ABSTRACT #2

Kidney Donation After Circulatory Death Using Thoracoabdominal Normothermic Regional Perfusion: The Largest Report of the United States Experience

Alice L. Zhou, MS[1], Albert Leng, BA[1], Jessica M. Ruck, MD[1], Armaan F. Akbar[1], BS, Niraj M. Desai, MD[1], Elizabeth A. King, MD[1]

(1) Department of Surgery, Johns Hopkins Hospital

Introduction: Thoracoabdominal normothermic regional perfusion (TA-NRP) has been increasingly utilized for donation after circulatory death (DCD) procurements in the United States. We present the largest report of outcomes of kidney transplants performed using DCD grafts perfused with TA-NRP.

Methods: Adult DCD kidney transplants between 2020-2022 in the United Network for Organ Sharing database were included. Donors with ≥50 minutes between asystole and aortic cross-clamp time in which the heart was also transplanted were considered TA-NRP donors. All other donors were considered direct recovery donors. Multivariable regressions were used to assess delayed graft function, as well as post-transplant survival and all-cause graft failure at 30, 90, and 180 days. A propensity-matched analysis of cohorts matched on donor Kidney Donor Profile Index (KDPI) was performed.

Results: Of the 16,140 total DCD kidney transplants performed during the study period, 306 (1.9%) utilized TA-NRP for organ recovery. Donors for which TA-NRP was utilized were younger (30 [23-35] vs. 43 [32-53] years, $p<0.001$) and had lower KDPI (0.2 [0.1-0.3] vs. 0.5 [0.3-0.7], $p<0.001$) compared to direct recovery donors. Recipients receiving grafts recovered using TA-NRP were younger (44 [36-56] vs. 57 [47-65] years, $p<0.001$) and more likely to be blood group O (60.8% vs. 45.9%, $p<0.001$). Transplants utilizing TA-NRP had lower likelihood of delayed graft function (adjusted odds ratio 0.22 [95% confidence interval: 0.15, 0.31], $p<0.001$), and similar 180-day post-transplant survival ($p=0.8$) and all-cause graft failure ($p=0.3$; Figure) as transplants utilizing direct recovery DCD grafts. These inferences were unchanged on propensity-matched analysis.

Conclusion: The lower risk of delayed graft function and similar post-transplant mortality observed among recipients of TA-NRP kidney transplants, even after adjusting for baseline characteristics, underscore the safety and efficacy of DCD kidney allografts procured using TA-NRP. Our results support the increased utilization of TA-NRP as a novel procurement technique for DCD donors.

EXAMPLE ABSTRACT #2 (cont.)

Figure. All-cause graft failure among kidney transplant recipients receiving TA-NRP vs. direct recovery DCD grafts in the United States, 2020 to 2022. TA-NRP, thoracoabdominal normothermic regional perfusion; HR, hazard ratio; CI, confidence interval.