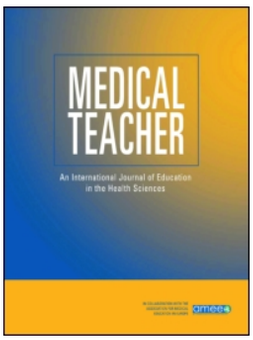

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TWELVE TIPS

Twelve tips on writing abstracts and titles: How to get people to use and cite your work

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ABSTRACT

The authors share 12 practical tips on creating effective titles and abstracts for a journal publication or conference presentation. When crafting a title authors should: (1) start thinking of the title from the start; (2) brainstorm many key words, create permutations, and ask others for input; (3) strive for an informative and indicative title; (4) start the title with the most important words; and (5) wait to finalize the title until the very end. When writing the abstract, authors should: (6) wait until the end to write the abstract; (7) copy and paste from main text as the starting point; (8) start with a detailed structured format; (9) describe what they did; (10) describe what they found; (11) highlight what readers can do with this information; and (12) ensure that the abstract aligns with the full text and conforms to submission guidelines.

Introduction

An engaging title and informative abstract, whether for a journal publication or a conference presentation, will help capture the attention of readers long enough for them to stop and learn more about your study and its implications. For a journal publication, you want readers (e.g. researchers, clinicians, educators, or policymakers) to discover your work, recognize its relevance and merit, read it, use it, and cite it in their own publications. For a conference abstract, you want participants to attend your session or stop at your poster, listen to your brief presentation, recognize the relevance and merit of your work, join your professional network, and anxiously await your full-text publication. In either case, potential readers will be quickly skimming many other titles and abstracts (e.g. PubMed search results, journal table of contents, conference proceedings, or other poster boards) all competing for their attention. Your title and abstract must stand out from the rest and communicate in very few words a captivating message.

Evidence suggests that there is substantial room for improvement in both titles and abstracts (Narine et al. 1991; Taddio et al. 1994; Pitkin & Branagan 1998; Pitkin et al. 1999, 2000; Dryver & Hux 2002; Siegel et al. 2005; Cook et al. 2007b). Guidelines developed by national workgroups recommend specific abstract structure and content (Haynes et al. 1990; Hopewell et al. 2008; Moher et al. 2009), and others have offered suggestions on the content and structure of titles and abstracts (Bordage 1989; Huth 1999; Day & Gastel 2012; Bordage et al. 2015; Cook 2016). The purpose of these Twelve Tips is to provide a practical guide for creating effective titles and abstracts. We do not dwell on specific content, but rather focus on the process. Our primary audience are authors writing full-text journal manuscripts, but most tips are also relevant to conference proposals.

Practice points

- The most important factor in getting your work found, read, used, and cited is an informative, indicative title in which the key words come first.
- Reporting detailed results in the abstract is the second most important factor in getting your work used and cited. We encourage use of the "more informative abstract" structure or similar subheadings, and the reporting of actual numeric data and qualitative themes.
- Reporting specific, actionable conclusions in the abstract is the third most important factor. Don't make readers guess at how these results will change what they do.

The title

Tip 1: Start thinking of the title from the start

Authors often neglect the title—putting it off until the end, and perhaps investing little time or thought in its creation. This is a significant oversight! The title is the first—and, if you're not careful, the *last*—thing a potential reader will read about your work. An engaging, descriptive title will entice the reader to read more, whereas titles that fail to accurately and concisely convey the message of the study will allow readers to skip ahead to the next abstract or article.

An informative title is the *single most important thing* that will get your article read, used, and cited, or your conference presentation attended and applied.

As such, the title merits more attention, at least proportionate to the number of words, than any other section of your manuscript. Start thinking about potential titles with the very first manuscript draft. Occasionally you will begin a

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manuscript with a fairly good idea for the title, but it should still be refined as suggested in the following tips.

Tip 2: Brainstorm lots of key words, create permutations, and ask coauthors and non-authors for input

The title is your "shortest possible abstract" (Bordage et al. 2015). Not only that, but long titles don't get read (to the point that some journals limit the length of titles). You'll need to make the most of those very few words!

Start by making a list of key words about your study. These might include words related to the topic ("communication skills"), intervention ("virtual patient"), theory ("self-regulated learning"), participants ("surgery residents"), outcomes ("skills retention"), the message ("improved feedback"), or study design ("randomized trial"). For each term in your initial list, try to come up with several alternatives, synonyms, or related expressions. For example, if your study is about resident "communication skills," your list of alternatives might include "counseling skills," "motivational interviewing," or "shared decision-making." Depending on your intended audience and your study's central message, each expression might attract more or less attention. Likewise, if your study enrolled first-year surgery residents, your alternatives might include "junior residents," "postgraduate trainees," "physicians in training," or "surgical interns."

Once you have generated a fairly extensive list of key words, use varying combinations and sequences to generate as many titles as possible (we usually produce at least a dozen candidate titles, often more). Reflect on these permutations, adding to and deleting from the list as you write and refine the manuscript main text.

Get feedback on your candidate titles from as many people as possible. Ask your coauthors to vote on their favorite three titles. Seek input from non-author friends, asking them which one(s) would most entice them to read the abstract.

Tip 3: Strive for an informative and indicative title

Huth (1999) noted that titles can describe what you found (informative titles, e.g. "Video-supported feedback is superior to audio-only feedback"), describe what you did (indicative titles, e.g. "randomized trial"), or both ("Video-supported feedback is superior to audio-only feedback: a randomized trial"). The best titles are usually both informative and indicative. A colon (":") can help to append indicative information to the title, using expressions such as "a systematic review," "a cohort study," "a national survey," or "a grounded theory study." We encourage authors to create titles that contain both informative and indicative elements.

We tend to avoid catchy, dramatic, fad, or gimmicky titles for original research studies or rigorous review articles, because they are easily misinterpreted and typically waste precious words with little specific information (i.e. are less informative and indicative). We also avoid questions ("What is the effect of personalized feedback?") because the answers—the informative element—are more useful. By contrast, for an editorial, commentary, perspective, or less formal review, a catchy, casual, fun, or provocative title is appropriate and often highly effective in attracting desired attention.

As a rule, avoid using abbreviations in the title.

Tip 4: Start the title with the most important words (but don't start with the method)

Don't begin the title with "randomized trial" or "systematic review." These words, while important, do nothing to engage the reader regarding your main message. Numerous randomized trials and systematic reviews are published every week. You must communicate—in the first few words—the key features that distinguish your study from all the rest! Imagine a potential reader sifting through a list of 350 articles from a PubMed search, looking for studies relevant to a study-in-planning or a systematic review. She is scanning articles quickly—looking for certain key words that she has identified as relevant to her work—and her brain is getting tired. You will make her life much easier, and increase the likelihood that she will discover your article, if appropriate key words come *first* in the title. An important indicative phrase (e.g. "randomized trial") can come at the end, once interest is already aroused, to confirm that this article is indeed worth reading.

Bottom line: It is essential not only to have the right key words in the title, but also to position these words where they will most readily catch readers' attention.

Tip 5: Don't finalize the title until the very end

Although you should begin writing the title with the very first manuscript draft, you should not finalize the title until the manuscript is otherwise complete. You need time for the title to percolate and evolve as you receive feedback and generate additional alternatives (see Tip #2, and examples in Table 1).

Moreover, the title should reflect, as accurately, completely, and concisely as possible, the central message of your study; yet that message usually becomes more focused as the manuscript matures. Only when the manuscript is complete can you select the title that most eloquently captures your bottom line. Be especially mindful that your title does not mislead, either by overstating your results or overstating the limits of your study design.

Some journals place limits on the number of words or characters in the title, and some have additional requirements regarding subtitles and phrasing. Read the Instructions to Authors carefully, and adhere to any requirements.

The abstract

Tip 6: Wait until near the end to write the abstract

In contrast with the title, wait until the manuscript is nearly complete before starting on the abstract. Sometimes creating a draft abstract early on can help to organize your thinking and provide structure for the manuscript as a whole. However, for practical reasons it usually makes sense to defer writing the final abstract until the very end. First, creating the abstract is easier once you have the full manuscript to draw from. You will work from what you actually said, rather than what you anticipate saying. Second, as with the title, you may not know until the end what data and conclusions are most central to your message. Third, waiting prevents problems with version control—that is, the

Table 1. Examples of title transformations.

Poor title	Better title	Rationale
Systematic review of assessments of medical student self-regulated learning	Assessing self-regulated learning in medical students: a systematic review	Don't start off with the study design; begin with words most likely to attract attention of potential readers
Does CBL work for medical student lectures?	Case-based vs non-case-based lectures for second-year medical students: a nonrandomized controlled study *Or* Improved retention with case-based vs non-case-based lectures for medical students: a nonrandomized controlled study	The acronym "CBL" could mean many other things including computer-based learning The poor title does not mention the comparison or the study design The poor title does not specify the stage of medical student training or the main findings; each better title resolves one of these deficits
Evaluating the role of Schmidt's intermediate effect in facilitating the cognitive development of third year medical students in a nephrology clinical rotation in Kenya	Reproducing the intermediate effect in third-year medical students: a randomized trial *Or* Clinical reasoning in third-year medical students: reproducing the intermediate effect	The poor title is very long and contains details that distract from the main message The better titles are shorter, more focused, and put key words up front. The choice between these two would depend on which key words would best attract your target audience
Give me credit for what I've done: improving maintenance of certification	Facilitating maintenance of certification for internal medicine physicians: a focus group study	The poor title might be appropriate as an editorial or perspective, but it is a bit informal for most original research articles. Note that the better title puts the key words near the front, to better attract attention

inconsistencies that inevitably creep in when you revise the main text after writing the abstract.

This rule is slightly different for short abstracts submitted for conference presentation. In those cases, preparing the abstract based on preliminary data and tentative analyses is common.

In creating an abstract you will invest meticulous effort in selecting key content, weighing the importance of each word, and iteratively polishing the prose. These steps are best done once—near the end of the writing process.

Tip 7: Copy and paste from the main text as the starting point

Copying entire sentences, including data, from the main text into the abstract is a highly efficient way to begin the abstract. As a rough start, pull in two to three key sentences each from the Introduction (including the statement of study intent [research question, hypothesis, or purpose] (Cook et al. 2007a)), Methods, and Discussion (often from the first or concluding paragraph), and several sentences from the Results (at least one sentence from each main analysis).

The resulting text will invariably be too long, unfocused, and disjointed. You will need to edit extensively to eliminate unnecessary details, extra words, and tangential thoughts to provide coherence and a natural flow, but at least you will be refining text rather than starting from scratch. Remove all references to other publications.

Tip 8: Start with a detailed structured format—Even if the journal doesn't require or allow it

Many journals favor unstructured abstracts or the familiar "Purpose–Methods–Results–Conclusions" format. Such simple abstracts commonly lack important details regarding methods and results (Taddio et al. 1994; Cook et al. 2007b). In 1987 the Ad Hoc Working Group for Critical Appraisal of the Medical Literature proposed standards for the "more informative abstract" (Huth 1987). These standards have since been revised (Haynes et al. 1990), and now include headings for background, objective, design, setting, participants, interventions, outcomes, results, and conclusions. In addition, many reporting guidelines now recommend specific abstract formats depending on the study design, such as systematic reviews (Moher et al. 2009) and randomized trials (Hopewell et al. 2008).

We strongly encourage the use of detailed structured abstracts (i.e. using the "more informative abstract" headings or headings appropriate to the specific study design). The detailed structure itself promotes readability, but more importantly the detailed structure encourages the inclusion of more information. Some authors and journals view the abstract like a movie trailer—a teaser to entice the potential reader to read the entire article. While it certainly does need to attract readers, the abstract facilitates additional tasks including peer review, database indexing, literature searches, and critical appraisal. The more information an abstract contains, the better it serves these additional functions. Also, when choosing which of several "competing" articles to read, readers will welcome the information contained in a detailed abstract. The more information in your abstract, the more likely it is that readers will find, recognize as relevant, read, and cite your work.

We encourage authors when writing their abstract to use the detailed structure most closely aligned with their study, even if the journal prefers a different format. The detailed headings encourage inclusion and sequencing of essential information and will also help you visualize the relative amount of text in each section (e.g. is the Conclusion longer than the Results?). If the journal does not permit a detailed structured format, you can always omit the structured headings and make minor adjustments in wording during later stages. For example, when writing the abstract to accompany a systematic review, use the structure recommended in the PRISMA guidelines (Moher et al. 2009) during the initial drafting, and then modify the headings if needed (e.g. to a Purpose–Methods–Results–Conclusions format) prior to submission.

Include in the abstract the key words you could not fit into the title. Literature searches in databases like MEDLINE or PubMed usually search the abstract along with the title

and formal indexing terms. Strategically ensuring that alternative expressions for key concepts are present in the abstract will increase the likelihood that a search will identify your article.

Tip 9: Describe what you did

Using the most appropriate structure, succinctly summarize the key aspects of your study. If you tested a theory, mention that theory by name. If you evaluated an intervention, briefly describe that intervention. If you compared that intervention against another intervention or a control group, describe what happened in the comparison arm. Briefly describe the eligible participants, study procedures, main outcome measures, and methods for qualitative data collection and analysis. We usually do not spend words naming specific quantitative statistical tests (e.g. "chi-squared test" or "t-test") unless they are particularly important in correctly interpreting the study results (e.g. a novel, unusual, or controversial statistical technique).

Tip 10: Describe what you found

Dedicate adequate space and attention to reporting your results. The Results section might easily comprise more than one-third of the total abstract length. Again, the more detail, the better. In quantitative studies, avoid using vague terms such as "increased" or "statistically significant difference." Instead, report the actual numbers and *p*-value or confidence interval; for example, "Posttest knowledge scores were similar in the case-based (mean [standard deviation]: 75.0 [12.3]) and non-case-based groups (74.7 [12.6]); 95% confidence interval for the difference, −4.4 to 5.0 ($p = 0.90$)." For qualitative research studies, instead of stating that "four themes were identified," report the actual themes. In a review or perspective, summarize the key points in as much detail as possible.

Reporting detailed results is the *second most important factor* in getting people to read and cite your work, second only to an informative, indicative title.

Tip 11: Highlight what the reader can do with this information

End the abstract with a concise conclusion that highlights defensible bottom line messages. Don't force readers to make inferences about your study findings; tell them outright what the results mean.

The conclusions should be brief—two or at most three sentences. They should not restate or summarize the results; the Results section is itself already a brief summary. Rather, use the conclusions to unambiguously but realistically and justifiably tell readers why these results are important and how this information will advance the field and change what they do.

Conclusions should be supported by the Results presented in the abstract (i.e. readers should not have to read the main text in order to justify the abstract's conclusions). If abstract results do not support the conclusions, then either add information to the abstract or adjust the conclusions accordingly. If you've properly selected the most important results and highlighted the most salient messages, such lack of alignment should not occur.

Reporting specific, actionable conclusions is the *third most important factor* in getting people to read and use your work.

Tip 12: Make sure the abstract aligns with the full text and conforms to submission guidelines

As a final step before submission, *print the abstract and manually verify each element* against the main text, with special attention to the results. Nothing should be reported in the abstract that is not reported in the main text, including methods, results, and conclusions (Bordage et al. 2015); yet inconsistencies arise when, for example, a preliminary statistical analysis is re-run with a slightly different technique or deleted altogether. Thus, every count, response rate, mean, standard deviation, *p*-value, qualitative theme, etc. must be checked for consistency. Carefully compare each datum in the abstract (numeric or narrative) one by one against the main text to verify that all data reported in the abstract were also reported in the main text, and that all data in the abstract match the data in the main text. Waiting to write the abstract until the main text is complete, and copy-and-pasting as suggested above, can prevent most problems in this regard.

Although journal instructions or conference submission guidelines should have been consulted from the outset, now is the time to verify one last time that the abstract adheres to requirements regarding word length, structure, and style (e.g. the journal may require that their abstracts be written in third person).

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The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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