

Do acronyms belong in the medical literature?

A Countercurrents Series^a: S.A. Narod MD PhD(Hon),*^{†‡} H. Ahmed BSc,*[†] and M.R. Akbari MD PhD*^{†‡}

After controlling for DS, RD, an interaction term for DS/cs, performance status, age, and cell type, cs was not an independent predictor of either PFS or OS.

That ungainly sentence, with its 7 acronyms (5 that are different), is taken straight from the abstract of a paper published in the *Journal of Clinical Oncology* in March 2015: “Does aggressive surgery improve outcomes? Interaction between preoperative disease burden and complex surgery in patients with advanced-stage ovarian cancer: an analysis of GOG 182”¹. The rest of the paper uses even more acronyms, which, in our opinion, make it close to unreadable—or at the very least, unpleasant to read. That feeling of unease prompted us to send a note to the editor of the journal, pleading for greater consideration of its readers with respect to the excessive use of acronyms. The literature contains many other examples, and the use of acronyms varies from journal to journal.

Kressel² provides the conventional wisdom behind the rationale for acronyms (abbreviations are efficient and useful), citing reduced keystrokes, decreased word count, acceleration of communication, and ease of mastery and writing. In fact, acronyms often impede rather than aid readability³. The sentence is shortened, but it is not necessarily more concise.

We find that when we read a sentence like the one quoted at the start of this article, we are distracted from the main message by investing our (somewhat limited) intellectual energy in deciphering the acronyms. Only after making that effort does the fog lift to reveal the landscape. Moreover, the glossary is sometimes on another page, which is particularly disruptive to the flow of thought.

We understood better what was going after we read Daniel Kahnemann’s book *Thinking, Fast and Slow*, wherein he discusses the internal competition in the brain⁴: Acronyms require an unnecessary investment of intellectual energy, which competes with the understanding of the main message. That is, either you focus on translating the acronyms or on understanding the sentence. Unfamiliar acronyms also often prompt rereading and forced consultation of the glossary, followed by a return to the sentence at hand. Rereading does not just waste time, it also increases the demand on short-term memory because readers have to invest most of their cognitive resources into finding the acronym’s long form while holding the short form in memory—thus having fewer resources available for the more important task of understanding meaning⁵. Readers agree with those neurolinguistic insights: One

study suggested that most readers self-report “serious degrees of frustration” with texts that have many acronyms (Beres T. DAIRSACC—Do acronyms influence reading speed and content comprehension? [Master’s thesis]. University of North Carolina; Chapel Hill, NC; 2007.

Acronyms are praised by some writers because they increase reading speed. However, they increase reading speed only if they are already familiar to the reader⁶. A few acronyms and symbols, such as DNA and cm, have become embedded in our unconscious memory, and no longer require active attention for deciphering; however, for most others, that is not the case. Authors often invent acronyms just for purposes of their paper, a practice that seems to be more and more popular, with the number of field-specific acronyms in certain fields nearly quadrupling in the space of 2 years⁷. In others, a single condition is abbreviated two or three different ways (or the reverse: two conditions share an acronym), which can create reading problems even for already-familiar authors.

Our benchmark for students and fellows is, if the acronym is not in everyday use (that is, part of the spoken language), then it should not be used in print. Examples of acceptable acronyms include PCR, which can be used in place of “polymerase chain reaction,” and pCR, which is short for pathologic complete response. The acronym ROC, for “receiver operating characteristic,” is in common use, but ROCA, which was coined by Jacobs *et al.*⁸ for “risk of ovarian cancer algorithm” is not. The acronym MSI, for “microsatellite instability” (which I myself have used) is in common use in written English, but not in spoken English⁹.

The most commonly cited reason for using acronyms is to keep the word count down. When faced with a manuscript that exceeds the word count, the choice is either to eliminate some material, to make the language more concise, or to condense the content using acronyms (often all three). In the paper mentioned at the top this article, 925 of 21,514 characters (4.3%) and 330 of 3338 words (9.9%) belonged to acronyms. If all the acronyms were to be removed and replaced with their full forms, approximately 5812 of 24,890 characters (23.4%) and 785 of 3946 words (19.9%) would be devoted to those terms. The difference is 455 words, which is not trivial (approximately a page of text). The use of acronyms also reduced, by 10%, the proportion

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of the total paper taken up by repeating terms. Converting words to acronyms was helpful in shortening the paper, but was it worth it in terms of the impact on readability? Did it make reading quicker? And does quicker reading actually increase readability?

The readability concept has been debated by linguists. Several studies have found little correlation between reading speed and comprehension¹⁰. A “readable” piece is efficient, but also accessible to researchers in all disciplines, creating a logical flow from sentence to sentence and *keeping the language as simple as possible*. Claiming that abbreviating words and phrases increases readability because it shortens reading time (at the risk of disrupting flow) is problematic, but that claim is what many authors who use acronyms cite in their defense. Other authors, including Kressel², describe a personal feeling that acronyms increase comprehension and are effective. Self-reports about acronyms are not unanimously positive though, and there is also very little linguistic evidence that acronyms increase reading comprehension, but there is considerable evidence that they impede it.

In summary, although acronyms might save space and sometimes might increase reading speed when they are familiar, there is little evidence that they increase readability and abundant information to the contrary. We urge medical writers and editors to curtail their use.

CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology's* policy on disclosing conflicts of interest, and we declare that we have none.

AUTHOR AFFILIATIONS

*Women's College Research Institute, Women's College Hospital, †Institute of Medical Science, University of Toronto, and ‡Dalla Lana School of Public Health, University of Toronto, Toronto, ON.

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