# Teaching Medical Writing

## The teaching of medical writing has arrived!

SECTION EDITOR

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How far does the academic medical world recognise the teaching of medical writing? Does PubMed include articles on courses, techniques, or material for the teaching of medical writing to health personnel or scientists? Teaching of medical writing is not commonly included in university programmes,[1] so perhaps it does not figure in academic publications. Furthermore, the EMWA journal *Medical Writing* is not indexed in PubMed.

I decided to see how many articles would be generated by a simple PubMed search of articles published over the course of 1 year, limited to free full text available in English (apologies to non-native English speakers, but in fact it did not change the number of articles) (Table 1). Many of the 109 articles generated discussed medical education in general, treatment of specific illnesses or symptoms (e.g., tremor, difficulty writing), clinicians' prescribing skills, administrative issues, research leadership, or scientific competencies, and a few discussed the quality of hand-written operative notes, medical writing techniques (such as hedging), ghostwriting, collaborative writing, and peer review.

Six articles dealt with the teaching of medical writing. Three papers provided writing advice for medical students and scientists, and the other three reported on the effects of specific writing programmes or interventions.

### Teachers' advice to medical students and scientists

**Gottlieb et al.,**[2] provide a "primer for junior academics" targeted at trainees in emergency medicine, but the advice is relevant for all academic medical writers. The authors describe the typical content and structure of journal articles (Introduction, Methods, Results, Discussion), the use of journals' author guidelines and reporting guidelines (the EQUATOR network), and the importance of a cover letter and of ensuring that your own work is identifiable (e.g., by obtaining a unique identifier through ORCID). They also discuss authorship roles and author order. The aspects I found particularly helpful for teaching purposes were:

- Two main strategies for determining the order of authors: the "sequence-determines-credit" approach (more common in the medical field) and the "equal contribution" approach (more common in other scientific fields)
- A detailed section on choosing an appropriate journal, with information about how to check whether a journal is indexed in an NLM database (including PubMed and Medline) and how to use the SCImago Journal and Country Rank index (SJR; based on the Scopus database[3]) to identify and rate journals in specific fields. (I found 41 open access journals in immunology and allergy, each with an SJR quality ranking, the H index, citation numbers, country of publication, and percentage of international collaboration. In my teaching, this will be a useful addition to the JANE server[4] that I usually tell students about.)
- Tips on how to "survive" the peer review process: e.g., preparing a point-by-point response to a decision letter and (highly recommended sometimes!) the value of waiting 1 to 2 days before responding "to let any strong emotions pass and allow you to focus on the scientific components of the paper" (p.1001).
- How to identify predatory open access journals that change publication fees without providing any significant editorial or publishing services (and may even change fees for the withdrawal of a paper from review if an author discovers its predatory nature). Tables 3 and 4 in the paper list criteria for determining the legitimacy of a journal and the features of a predatory journal. (Unfortunately, these are now necessary topics in medical writing courses for authors in the health sciences.)

**Iskander et al.,**[5] write from 30 years' experience with a scientific writing course for public health students and professionals. They mention similar points to Gottlieb et al., but have additional items:

- As an early step in drafting your article, write out the "take-home message" and share it with co-authors for their review and comment. This helps to ensure agreement on relevant structure and content of the manuscript.
- If you have not already planned your tables and figures at the protocol stage, consider starting the Results section by drafting the figures and tables, then develop one to two sentences that summarise each one. You are more likely to focus on the most relevant results for the research question – linked to the take-home message.
- The Abstract should not be written in a hurry

***Table 1. Search history in PubMed on teaching medical writing***

| Search | Add to builder | Query | Items found |
|---|---|---|---|
| #5 | Add | Search ((writing[Title/Abstract]) OR medical writer*[Title/Abstract]) NOT case report[Title/Abstract] Filters: Free full text; Publication date from 2018/03/01 to 2019/02/28; Humans; English | 109 |
| #4 | Add | Search medical writing Filters: Free full text; Publication date from 2018/03/01 to 2019/02/28; Humans | 149 |
| #3 | Add | Search medical writing Filters: Publication date from 2018/03/01 to 2019/02/28; Humans | 256 |
| #2 | Add | Search medical writing Filters: Publication date from 2018/03/01 to 2019/02/28 | 1,057 |
| #1 | Add | Search medical writing<br>Study types: Clinical study/trial + Comparative study + Evaluation studies + Meta-analysis + Review | 11,090 |

at the last minute! It helps a reader to decide whether to read further, so make it count. Review your completed manuscript to identify the main aspects of the methods and results and a clear conclusion.

**Peterson et al.,**[6] offer "10 simple rules" to help scientists improve their writing productivity, including these useful reminders:

- It may help you to write more regularly if you develop your own "triggers" for writing, e.g., music, a brisk walk, or making a cup of tea.
- When you ask for feedback on your writing, make it clear what sort of feedback you want – on the whole text or a specific section? On the structure only? Or the grammar as well?
- You need time to reflect on your writing, so instead of delaying until the last minute, make a start and work on it regularly.

## Evaluating the effects of writing programmes or interventions

**Duncansen et al.,**[7] investigated the publication outcome and skills development among 50 first-time researchers who participated in "writing bootcamps" in rural Australia between 2012 and 2015. The researchers had a weekly group teleconference for 6 weeks then two follow-up teleconferences within 3 months. The homework was working on own text and providing written feedback to each other. Despite possible self-selection by those more interested in writing for publication or with research findings worthy of publication, more of the programme participants (52%) submitted manuscripts to peer-reviewed journals (of which 42% was published) than did non-participants (15%). The participants reported increased confidence in scientific writing and had valued the support from their peers, especially the giving and receiving of feedback on their writing.

**Sahoo and Mohammed**[8] described an educational writing programme for Malaysian medical students aimed at developing critical thinking skills. The focus of the 4-week programme was on justification and reasoning in writing research proposals. The 188 students made a literature search, developed relevant research questions for a clinical study, and were then randomly divided into small groups to write a research protocol. The students' written comments on their learning process make interesting reading. They clearly enjoyed the tasks (referring to the assignments as "fun") and found the group work useful ("I could learn better by sharing my thoughts"). The authors recommended the inclusion of writing modules in the core medical curriculum – structured in a collaborative learning format but with reflective practice embedded – to foster the skills of critical thinking and collaboration.

**Ruscetti et al.,**[9] set out to develop a method to assess the quality of quantitative writing for their biology students at a Californian university and ended up with a useful educational tool. They analysed 'quantitative comparison' statements in the literature (e.g., "Average height was 25% higher in Group A than in Group B.") and concluded that such statements need four elements (4C): *Comparison* (Group A vs Group B), *Calculation* (25% higher), *Context* (average height), and *Clarity* (the first three elements are in the same sentence with no redundancy or contradiction). The authors initially used these four rules to give feedback to the students on their writing but have since used them in teaching, for example, in writing exercises to practise sentence construction.

## Conclusion

PubMed certainly does include articles that describe medical writing courses or that evaluate writing interventions for medical and scientific researchers. The six articles I identified were written by authors at different institutions in various countries and were published in a range of medical and scientific journals. I found the content relevant for my own teaching, and I hope that others will also find it useful. I would be interested to hear from any reader who has other experiences or suggestions for teaching medical writing that they would like to share. In the meantime, I will continue to review PubMed now and again for relevant articles.


## Acknowledgements

Thank you to Jude Pedersen for her comments on the manuscript.


## Conflicts of interest

The author declares no conflicts of interest.

## References


1. Madani A. Universities should offer medical writing courses at the undergraduate level. Medical Writing. 2017;26:68–9.
2. Gottlieb M, Lotfipour S, Murphy L, Kraus CK, Langabeer JR 2nd, Langdorf MI. Scholarship in emergency medicine: A primer for junior academics, Part I: Writing and publishing. West J Emerg Med. 2018;19(6):996–1002.
3. SCImago, (n.d.). SJR – SCImago Journal & Country Rank [Portal]. [cited 2019 March 27]. Available from http://www.scimagojr.com.
4. JANE - Journal/Author Name Estimator. [cited 2019 April 23]. Available at: http://jane.biosemantics.org.
5. Iskander JK, Wolicki SB, Leeb RT, Siegel PZ. Successful scientific writing and publishing: A step-by-step approach. Prev Chronic Dis. 2018;15:E79.
6. Peterson TC, Kleppner SR, Botham CM. Ten simple rules for scientists: Improving your writing productivity. PLoS Comput Biol. 2018;14(10):e1006379.
7. Duncanson K, Webster EL, Schmidt DD. Impact of a remotely delivered, writing for publication program on publication outcomes of novice researchers. Rural Remote Health. 2018;18(2):4468.
8. Sahoo S, Mohammed CA. Fostering critical thinking and collaborative learning skills among medical students through a research protocol writing activity in the curriculum. Korean J Med Educ. 2018;30(2):109–118.
9. Ruscetti T, Krueger K, Sabatier C. Improving quantitative writing one sentence at a time. PLoS One. 2018;13(9):e0203109.