

Digital Communication

Editorial

Collaboration has always been a cornerstone of medical writing. However, how we collaborate has undoubtedly changed in the digital age. Sophisticated online communication and collaboration tools make it much easier to connect with colleagues around the world to work together on multidisciplinary, international projects. By now, we are all quite familiar with cloud-based applications like those from Google Suite and Microsoft 365.

Their tremendous contribution to improving productivity and efficiency in our project teams is similarly well-recognised, especially when it comes to co-authoring documents. With the recent boost in the development of AI technology and applications suitable for medical writing, we are excited to learn more about how AI will once again reform how we author, communicate, and collaborate online. My colleagues from TFS HealthScience shed light on

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a next-generation AI tool from Microsoft that could take our collaboration and authoring activities to the next level. I hope you enjoy learning about this new technology as much as I did.

Nicole

Embracing artificial intelligence in medical writing: A new era of efficiency and collaboration

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Artificial intelligence (AI) tools have already shown great promise in improving the workflows of key tasks and processes within medical writing,¹⁻⁴ freeing up time for us humans to focus on those unique abilities AI cannot replace...yet. At the top of the list are critical thinking, analytical skills, emotional intelligence, and creativity. More than that, we can harness those abilities to collaborate in multidisciplinary, international teams to create innovative and apt solutions – an integral part of our daily work as medical writers, particularly in joint tasks such as co-authoring. Indeed, digital collaboration tools for project teams are abundant (e.g., Google Suites, Asana, and Microsoft Teams) and have transformed the way we work,⁵ especially now that remote work has become the norm. Nevertheless, collaborative technology using AI appears to be lagging slightly behind in the new wave of AI tools suitable for medical writing. With the application of emerging technologies and AI on the rise, the potential for automating the collaborative medical writing experience looks promising.

What is artificial intelligence?

AI is a general term describing computer systems with the ability to model human intelligence. It is a broad field that encompasses many different subfields, including machine learning and natural language processing, all of which are now widely recognised terms that have generated much interest in recent years. The idea of creating intelligence is, however, not new; it has fascinated people for centuries and is mentioned in Greek mythology and the famous novel about Frankenstein's monster, originally from 1818.⁶⁻⁸

Put simply, AI is the creation of a system that uses algorithms to perform tasks that would normally require human intelligence, such as visual and speech recognition, decision-making, and language processing.⁹ In certain cases, it even outperforms humans, including the pace at which humans can operate and process information. AI's strength is its ability to collect big data, analyse them, identify patterns, learn from them, and extract an output without any human intervention. Its weakness (or one thereof) is its ineptitude in performing uniquely human abilities,¹⁰ which are essential in medical writing.

The progress of more advanced AI technologies alongside increased computational

power has fuelled explosive development within the field. With the release of ChatGPT by OpenAI in November 2022, the term “large language model (LLM)” has become widely used when talking about AI. As a generative pre-trained transformer (GPT), ChatGPT has been trained on a vast amount of text data so that when provided with text, it uses algorithms and statistical models to analyse the words and their

relationships with one another. The model then predicts what comes next based on its learnings from the data on which it was trained.

ChatGPT, quite impressively, reached over one million users in just five days and 100 million monthly active users in two months after its launch, making it the fastest-growing consumer application in history.^{11,12}

AI is steadily making its way into many areas and fields, as illustrated by the number of

papers published in PubMed with the term “artificial intelligence” (Figure 1). Though the first paper was published as early as 1951, development in the field has been very rapid in the last five years, with approximately 200,000 articles (and counting) spanning the field of medical research published today. Interestingly, the total number of articles containing the term “artificial intelligence” is already much higher

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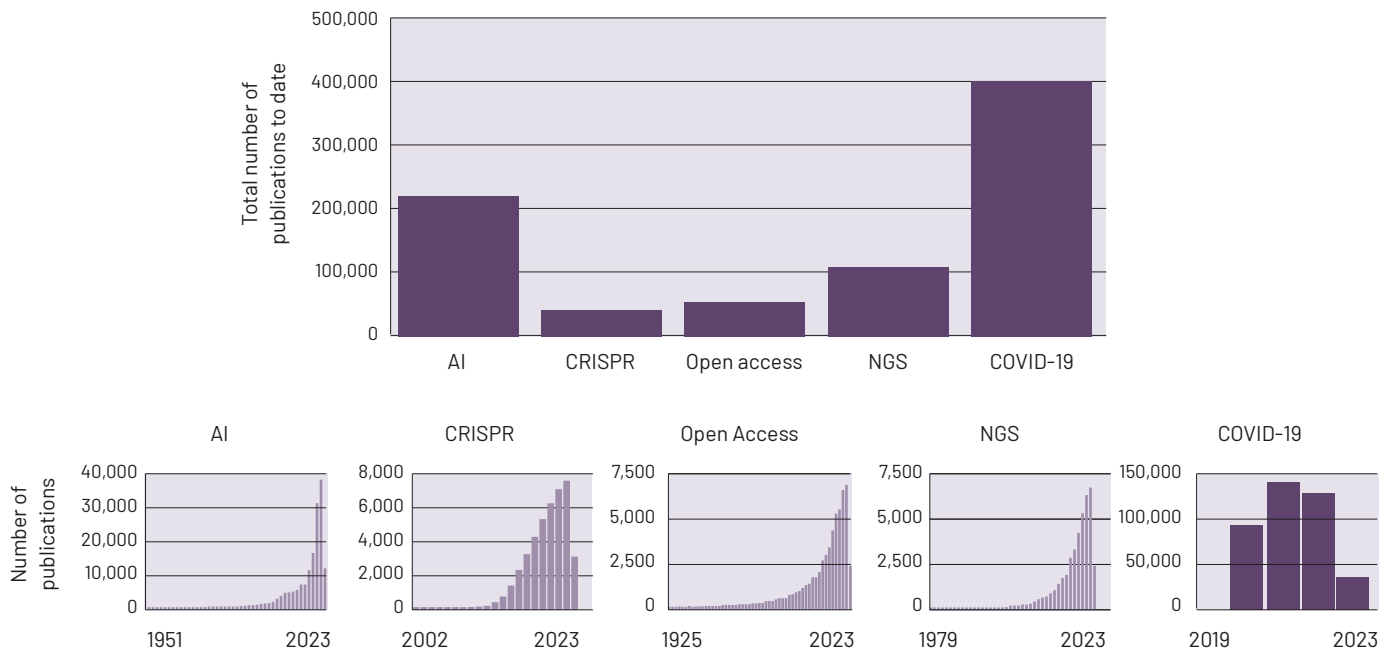


Figure 1. A comparison of the number of publications on PubMed among different “hot topics” in the medical/scientific field and artificial intelligence

Abbreviations: AI, artificial intelligence; CRISPR, clustered regularly interspaced short palindromic repeats; NGS, next-generation sequencing; COVID-19, coronavirus disease 2019.

than several other hot topics in recent years, including open access, clustered regularly interspaced short palindromic repeats (CRISPR), and next-generation sequencing (NGS), none of which come close to the search results for coronavirus disease 2019 (COVID-19) (Figure 1).

What can AI do for medical writers?

Given the complexity and variety of tasks involved in medical writing, it is highly advantageous that AI can assist medical writers in a number of ways (Figure 2).¹⁻⁴

However, AI support for tasks like collaboration is not available on quite the same level yet.

Tracking progress, managing deadlines, and communicating with colleagues form a significant part of a medical writer’s repertoire. These activities not only make it easier to work together on large-scale projects, but doing so effectively is also critical to the success of such projects. Digital communication tools and channels, in particular cloud-based applications (apps) such as Microsoft 365 SharePoint,

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OneDrive, and Teams, are standard in our industry and have proven exceptionally useful in facilitating these activities.¹³ Similarly, co-authoring or collaborative authoring of documents is powered by cloud-based apps to improve productivity and efficiency, as the demand for a quick turnaround of high-quality documents continues to grow, to support the rapid pace at which new therapies are being developed. It is, therefore, no surprise that AI technology is being integrated into cloud-based apps to optimise and personalise the digital communication and collaboration experience.

A look into Microsoft 365 Copilot

Microsoft provides some of the most popular authoring, communication, and collaboration apps – most of which we, as medical writers, use daily (Figure 3). So, one could say it was inevitable that this tech giant would develop AI technology suitable for enhancing the medical writing experience. In March 2023, Microsoft announced its next-generation AI tool, Microsoft 365

Copilot.¹⁴ Though not yet available on the market, it has the potential to take the use of their tools/apps and our co-authoring and productivity to the next level.

This AI assistant is powered by the advanced LLM GPT-4 and works in tandem with Microsoft Graph – an application programming interface that gives developers access to a broad spectrum of Microsoft 365 services. With this unique combination, Copilot can enhance the user experience for Microsoft 365 apps, making them more intuitive and user-friendly. One could think of it as having a ChatGPT built into – what is for many medical writers – our normal digital work environment with the apps we use every day. However, according to Microsoft, Copilot is even better than that.^{15,16}

The typical Microsoft 365 user tends to use only a limited number of available features and functions across the various apps – a limitation brought about by the demand for users to be technologically savvy and the time it takes to develop the necessary know-how. The implementation of Copilot aims to improve accessibility to a wider range of functionalities by providing the possibility to write prompts to guide Copilot’s task performance. Since Copilot performs tasks based on simple text input, users will no longer need advanced knowledge or skills

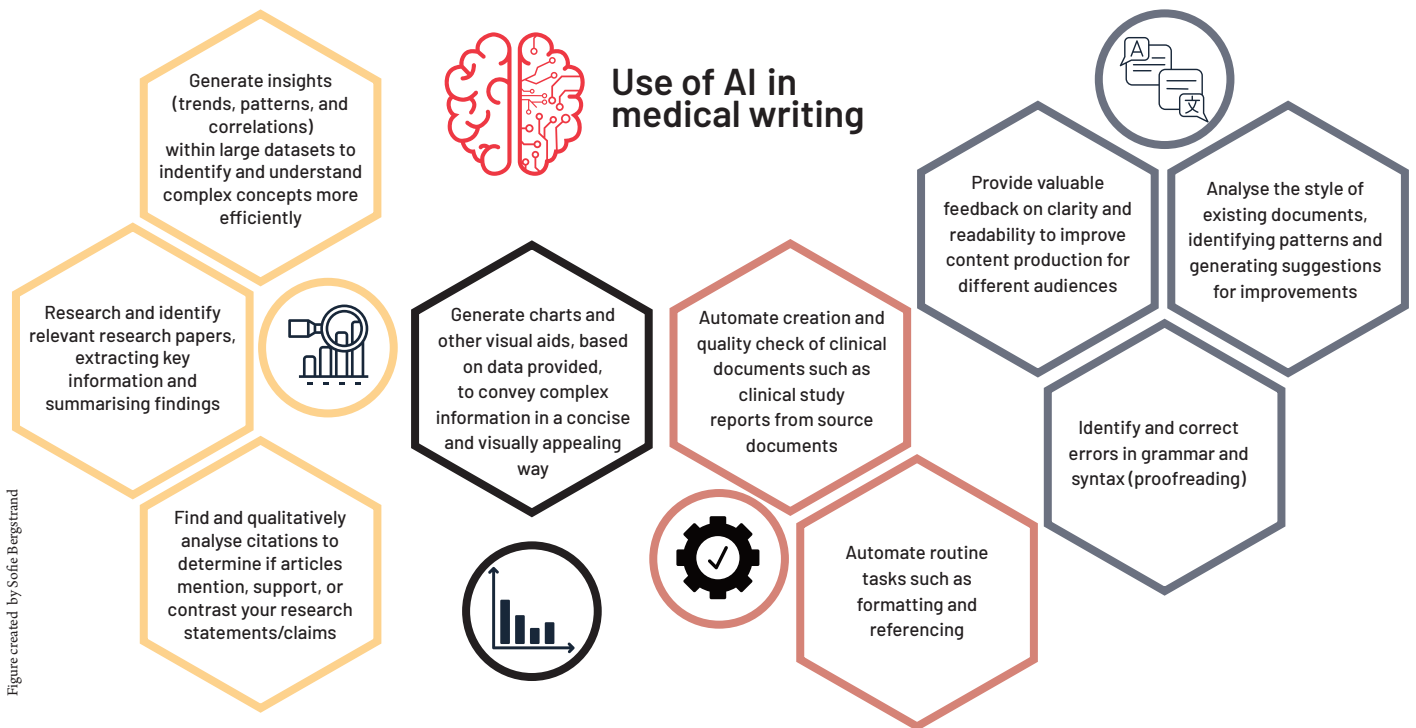


Figure 2. A selection of AI features suitable for medical writing

to use the Microsoft 365 apps to their full potential. This could facilitate a smoother onboarding experience for novice users and provide speed and even more functionality to advanced users.

For medical writing professionals, the features offered by Copilot could be very useful across several popular apps (Figure 3).

Word

With the integration of Copilot in Microsoft Word, users can instruct Copilot to generate a first draft or a document structure complete with headings and subheadings. This draft can be sourced from information available on the internet, used to train GPT-4, or from local documents. For instance, to generate an abstract for a review article, users can simply request Copilot to “write a 300-word abstract summarising document X,” and within seconds, a draft will be produced, providing a starting point for the writing process. Similarly, Copilot can be asked to “write a 150-word paragraph about topic X” after which it will provide text based on the data used to train the model.

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Excel and PowerPoint

The use of Copilot in Microsoft Excel and Microsoft PowerPoint exemplifies well the easy unlocking of features through which users can, for example, prompt Copilot to “present the data in sheet X in a pie chart using different shades of blue” or “present the information in document X in a PowerPoint presentation”. Even if these prompts do not generate perfect results, users can modify their prompts, try again, and quickly end up with something that can be edited, instead of starting from scratch and doing everything manually.

SharePoint, OneDrive, and Teams

The Microsoft apps OneDrive, SharePoint, Teams, and to a lesser extent, Outlook, offer many useful solutions for document sharing, meeting, and chat functionality. Adding

Copilot on top of these will enable functions such as:

- Summarising long email threads and quickly drafting suggested replies
- Automatically producing meeting notes after Teams calls with summaries of key discussion points
- Easily drafting project updates from meeting notes and email conversations

Copilot is currently being tested by selected business clients and in an invitation-only paid preview version.¹⁷ In an article by Microsoft in May 2023, the corporation announced that they have broadened access to Copilot from 20 to 600 enterprises worldwide and added several new capabilities, including Copilot in Outlook, Copilot in OneNote, and Copilot in Viva Learning.¹⁸ Additionally, they have released new data, presenting their findings from a survey of 31,000 people in 31 countries.¹⁹ The data highlight the exponential pace and volume with which work has increased, and the eagerness from business leaders and employees for AI to help lift the burden.¹⁹ It will be exciting to see how well it works and how easily it can be integrated with our workflows.

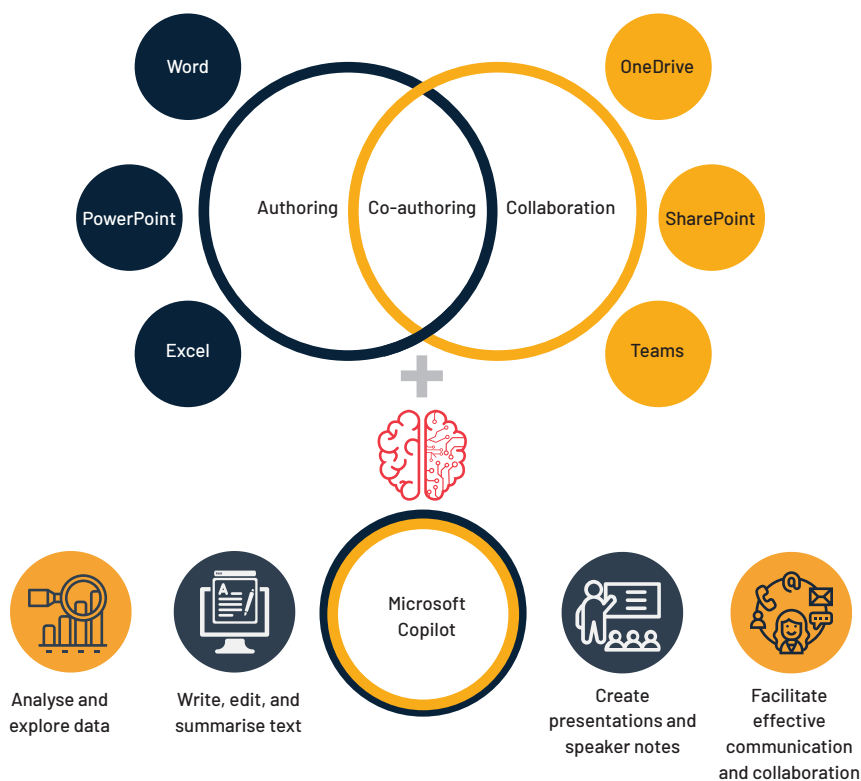


Figure created by Sofie Bergstrand

Figure 3. How Microsoft Copilot can take co-authoring to the next level

Challenges with using AI tools in medical writing

With the possibility of integrating AI technology with our everyday digital tools, it is important to consider the long list of challenges that might arise with their use, of which privacy, confidentiality, and accuracy are at the top.

Legislation and regulation, especially in highly regulated industries like healthcare, pharma/biotech, and by association, medical writing, are major concerns. Authorities such as the EMA, the FDA, and the Medicines and Healthcare products Regulatory Agency (MHRA), are all keeping a close eye on developments within the AI field.²⁰⁻²² The liability and accountability of AI-generated text and their platforms are still uncertain, and compliance with regulations and standards must be ensured. Confidentiality is a particularly sensitive topic since many of the AI services available use input data to keep training the model, which becomes problematic when working with confidential material.

As LLMs generate text based on already existing text without providing sources, plagiarism comes into play as well. These very valid concerns have already led to reactions within the publications community.²³ For instance, ChatGPT has been banned as a

co-author of scientific papers, and many publishers are requesting that authors clearly state if and how they have used AI tools in their writing.²⁴ ChatGPT was also banned by Italy's Data Protection Authority in Spring 2023 when the agency complained about the lack of a legal basis to justify the collection and storage of data.²⁵ As addressed by the WHO, it is also important to keep ethical considerations, such as patient safety, inclusivity, and equity, in mind when developing and using these tools.²⁶ It is clear that this rapid technological development leads to difficulties in establishing laws and regulations to accompany the timely use of AI tools and services in a "safe" way.²⁷

Another important, inherent challenge is quality control. The accuracy and reliability of AI-generated text depends on the quality and quantity of data used to train the model. If the model is not trained on sufficient, relevant, and diverse data, it may generate inaccurate or misleading information.²⁸ This concept of answering convincingly but inaccurately is called hallucinating;²⁹ and was exemplified in a study³⁰ which showed that four out of five ChatGPT-generated articles were found to be significantly inaccurate. All of them were, however, written with convincing and coherent language, making it difficult to spot errors for non-expert readers.

In contrast, another study³¹ showed that ChatGPT was able to answer questions within a wide range of medical fields accurately. This shows that LLMs can generate accurate content, but there is also a high risk of inaccuracies making their way into the text. It should be noted that due to the underlying technology, LLMs are language models, not knowledge models.

Favourably, Microsoft, in its development of Copilot, has taken care to address some of the above concerns. According to their blog, they "are guided by their AI principles and Responsible AI Standard and decades of research on AI, grounding, and privacy-preserving machine learning".³² Their Responsible AI Act³³ and Microsoft Privacy Statement³⁴ are additional guides to developing trustworthy AI technologies for their users. As an example, they state that their AI tools will be run locally on the user's device, meaning that no data contained within the documents of a user can be leaked to other users.

Unlike Copilot, ChatGPT is open to the public free of charge because it is in its research and feedback-collection phase. In an article by ChatGPT,³⁵ the chatbot argues that stringent oversight and regulation of LLMs might "stifle innovation and prevent the technology from reaching its full potential". However, it recognises

the importance of having safeguards in place "to prevent the technology from being used for nefarious purposes," and suggests that a regulatory body that would work closely with the developers and users of the technology should be established specifically to oversee the use of LLMs and ensure responsible use.³⁵

OpenAI is also taking steps towards addressing these concerns and has implemented an option for users to prevent their input data from being used to further train the model. A ChatGPT Business version is also planned, which will be a paid subscription allowing users more control over their data.³⁶ Regarding accuracy and hallucination challenges, for now, it will be up to us users to keep this phenomenon in mind and check that the content generated is factual. However, it is likely that this will also be improved with further technological developments.

Future perspectives

It is still early days, but AI really does have the potential to revolutionise the way medical writers work. As a supporting tool, AI can help to optimise our productivity and efficiency, whilst we channel our uniquely human insights and expertise to collaborate and generate high-quality content. Nonetheless, our ability to adapt to, collaborate with, and incorporate AI in our medical writing practices will play a significant role in maximising its potential benefits. Integrating AI technology into apps with which we are already familiar and trust will aid in this transition. Ongoing research and development are further needed to ensure the accuracy, fairness, and reliability of AI-generated medical writing, as well as regulatory and legal frameworks to govern its use. With the responsible use of AI, we are heading towards an exciting future in which our role as medical writers will evolve alongside the evolution of AI technology.

Disclaimers

The opinions expressed in this article are the authors' own and not necessarily shared by their employer or EMWA.

Disclosures and conflicts of interest

The authors declare no conflicts of interest.

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