

# Generative artificial intelligence in medical scientific writing: Practical and ethical considerations

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## ABSTRACT

Generative artificial intelligence (AI) is transforming scientific communication in health, offering opportunities to improve the quality and efficiency of academic writing. This article provides practical guidance for healthcare professionals on the ethical and effective use of AI tools in preparing scientific manuscripts. It addresses the fundamental ethical principles established by international publishing organizations, practical implementation strategies, a structured workflow, and specific considerations for pediatric literature.

The responsible integration of these technologies can help democratize access to scientific publishing, particularly for researchers whose native language is not English, while maintaining the highest standards of academic integrity.

**Keywords:** *artificial intelligence; pediatrics; ethics in scientific publishing; generative artificial intelligence; large language models.*

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## INTRODUCTION

The emergence of generative artificial intelligence (AI) in November 2022 has sparked intense debate in academic circles about its role in the production of scientific knowledge, raising fundamental questions about authorship, integrity, and the future of scientific communication.<sup>1,2</sup> Since the launch of ChatGPT in November 2022, these tools have become accessible to researchers around the world, significantly transforming academic writing processes and generating both excitement and concern in the scientific community.<sup>1</sup> Large-scale language models have demonstrated the ability to create contextually relevant text, making them a powerful tool within the discipline of natural language processing.<sup>3</sup>

AI represents an opportunity to overcome historical barriers to the dissemination of academic and scientific activity, as scientific writing in English is a challenging task for non-native speakers, who often face significant difficulties in writing clearly, concisely, and without grammatical errors, resulting in texts that do not compare favorably with those produced by native speakers.<sup>4</sup> These language barriers directly contribute to lower acceptance rates in prestigious journals and ultimately perpetuate inequalities in the dissemination of regional scientific knowledge.

AI can help facilitate access to scientific publishing by offering freely available language assistance tools, optimizing literature reviews, organizing information, and improving writing clarity.<sup>5</sup> However, these technologies also raise urgent questions that require careful answers.<sup>6</sup> Studies have documented significant problems, including unintentional plagiarism, AI “hallucinations” that generate false information, and fabricated bibliographic references, raising legitimate concerns about the usefulness, accuracy, and integrity of AI when used to write academic manuscripts.<sup>1</sup>

The international academic community has responded with guidelines that address core ethical concerns, including authorship qualifications, mandatory disclosure of AI use, and attribution of responsibility.<sup>7</sup>

## FUNDAMENTAL ETHICAL PRINCIPLES

### AI is not an author, but a tool

The international consensus is clear: AI tools cannot be listed as authors of scientific manuscripts under any circumstances.<sup>6,7</sup> This position is based on the established definition of academic authorship, which requires

substantial contributions to the conception of the study, methodological design, data analysis, interpretation of results, manuscript writing, and approval of the final version. Fundamentally, authorship implies the ability to take public responsibility for the content and defend the claims made before the scientific community, functions that an AI system cannot perform.<sup>4</sup>

As Cohen and Moher point out in their analysis of whether generative AI is a friend or a foe of academic writing, scientific and ethical responsibility for the results generated rests entirely with human researchers.<sup>6</sup> This position reflects that AI cannot replace human scientific judgment or issue independent interpretations. Authors must be able to defend every claim in the manuscript, verify the accuracy of the data presented, and respond to questions from reviewers and the scientific community.

### Transparency as an unavoidable requirement

Disclosure of AI use is a fundamental ethical requirement, as it underpins the integrity of the scientific publication process.<sup>1,7,8</sup> Authors should provide detailed information, including the full name and version of the tool used, the specific purpose of its application, the sections of the manuscript where AI assistance was used, and the degree of human oversight applied to the generated content. Best practices established by publishing organizations recommend that authors describe in accessible language how AI was used, including the known limitations of these tools.<sup>8</sup>

Hryciw et al.<sup>3</sup> propose a classification system for the responsible adoption of AI in medical scientific writing that articulates five key elements: clearly specifying the level of AI assistance employed, detailing the degree of human involvement and supervision, technically describing the tool used with its name and version, explicitly addressing relevant ethical considerations, and openly acknowledging inherent limitations, including possible biases and inaccuracies.<sup>1</sup> This framework provides a practical structure for transparent use and communication.

### Rigorous verification of content

All content generated or modified with AI assistance must undergo thorough verification before inclusion in a scientific manuscript.<sup>1,9</sup> Language models can produce information that appears to be correct but contains factual errors, fabricate non-existent bibliographic references, and generate content with systematic biases

derived from the data used in their training. The verification process should include independent confirmation of the accuracy of all numerical data and statistics, validation of each reference by searching academic databases, careful evaluation of the consistency between the content and methodology, and review for possible biases, technical inaccuracies, or inappropriate terminology.<sup>9-11</sup>

## PRACTICAL IMPLEMENTATION STRATEGIES

An ethically acceptable application of AI is the generation of initial structures, organizational outlines, or preliminary ideas that the author subsequently develops by incorporating original content derived from their research.<sup>1,12</sup> Drake and Han describe fifteen fundamental steps for writing an effective scientific article, and AI tools can productively assist in the initial stages of conceptual organization and argument structuring.<sup>13</sup> AI can suggest logical outlines and identify connections between sections, but the substantive content must come from the researcher's knowledge and analysis.

A particularly relevant pediatric study evaluated whether ChatGPT-4 can improve the quality of medical abstracts prepared for presentation at scientific conferences.<sup>14</sup> The results revealed that, although ChatGPT-4 does not directly produce abstracts of better quality than those prepared by the researchers themselves, it offers constructive suggestions that can be used to improve the final product significantly.

## STRUCTURED WORKFLOW

Based on the available evidence and expert recommendations, a six-step workflow is proposed for integrating AI ethically and effectively into the scientific writing process.<sup>1,3,8</sup> *Figure 1* shows the workflow process:

1. **Initial planning:** the researcher independently completes the study design, data collection, statistical analysis, and interpretation of results without AI intervention.
2. **Human draft:** The researcher writes the first draft, establishing the basis for the original content.
3. **AI assistance:** Selective application of AI tools for linguistic refinement and structural optimization.
4. **Critical verification:** Systematic review of all AI-assisted content, data validation, and reference confirmation.

5. **Final review:** critical evaluation by co-authors and final adjustments.

6. **Documentation:** transparent record of AI use according to the requirements of the target journal.

## Distinction between editing and content creation

There is a fundamental ethical distinction between using AI to edit text originally written by the author versus using it to generate new content from scratch.<sup>1,8,15</sup> Grammatical and structural editing of drafts previously written by the researcher is generally accepted; in contrast, the generation of new scientific content raises greater ethical concerns related to authorship and originality. Comparisons between AI-generated case reports and those written by medical professionals reveal that expert human supervision remains essential.<sup>16</sup> *Table 1* shows the situations in which it is appropriate to use AI and when it is not recommended.

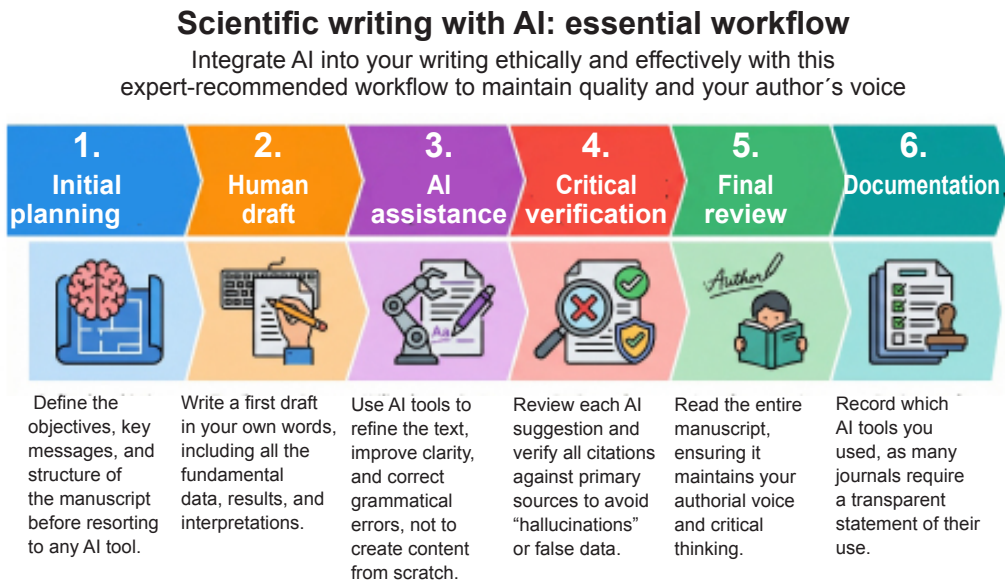
## AVAILABLE TOOLS

The ecosystem of AI tools for scientific writing can be systematically organized by specific function.<sup>5,9,11</sup> For **writing assistance**, the following stand out: OpenAI's ChatGPT, Anthropic's Claude, and Google's Gemini offer advanced capabilities for generating and refining academic text. For **literature search and synthesis**, specialized tools such as NotebookLM, Elicit, Consensus, and Research Rabbit use AI to identify relevant publications and generate evidence summaries. For **editing and proofreading**, applications such as Grammarly, Paperpal, and QuillBot specialize in improving grammar, style, and clarity. For **reference management**, systems such as Paperpile and Mendeley facilitate bibliographic organization, while Scite.ai allows you to verify the context of citations.

This is just a sample of the tools available; however, the environment is constantly evolving, and new ones are likely to appear. On the other hand, many are free in their basic versions or have low monthly subscription costs, making them affordable. *Table 2* shows the access details for each one, a description of their main features, and prices as of January 2026.

## SPECIFIC CONSIDERATIONS FOR PEDIATRIC PUBLICATIONS

The pediatric population has significant characteristics that must be considered

**FIGURE 1. Essential workflow for integrating artificial intelligence into academic publishing**

Source: This figure was created with the assistance of NotebookLM for content organization.

when using AI tools for writing scientific papers.<sup>14,17</sup> Terminology specific to pediatric medicine, including age-based reference ranges, weight-adjusted dosages, developmental milestones, and conditions unique to childhood, may not be adequately represented in general language models and may require specialized verification. Ethical considerations related to research involving children, minor assent processes, and parental informed consent demand special attention and terminological precision.

The balance between technological innovation and specialized human expertise is particularly relevant in pediatrics.<sup>15</sup> Pediatricians must prioritize clinical judgment as a central element of the scientific writing process, using AI as a complementary tool that can improve efficiency and linguistic quality, but which should never replace specialized knowledge or expert supervision.

## CONCLUSION

The integration of AI into pediatric scientific writing represents both a transformative opportunity and a significant ethical responsibility. Latin American pediatricians can benefit substantially from these tools to overcome historical language barriers and improve the technical quality of their publications, thereby

enhancing international visibility for regional pediatric research.

Key points for successful and responsible integration include maintaining human authorship and responsibility as absolute and non-negotiable principles; practicing complete transparency in disclosing the use of any AI tools; applying thorough verification of all AI-assisted content before submission; using AI as a complementary support tool, never as a substitute for critical thinking and scientific judgment; and staying constantly updated on evolving editorial policies.

The future of scientific writing involves greater integration of AI tools.<sup>5,9</sup> The key to successfully navigating this transition lies in adopting these technologies in an informed, critical, and responsible manner, so that they strengthen the integrity of scientific communication and genuinely contribute to the advancement of pediatric knowledge in our region.

## Note: Manuscript preparation methodology

A "human-in-the-loop" approach was used, employing the following tools.

- Analysis and visualization: NotebookLM for the summary of key literature and figure design.
- Search and management: Research Rabbit for identifying complementary citations and Paperpile for bibliographic management.
- Text editing: Claude (Opus 5.5 version) for

TABLE 1. Ethical classification of the use of AI in scientific writing

Area 1 Ethically acceptable	Area 2 Ethically questionable (Contingent)	Area 3 Ethically unacceptable (Not recommended)
<p><b>Approach:</b> AI acts as a tool for polishing and linguistic assistance. The author retains full control over the content and message.</p> <p><b>Permitted applications</b></p> <ul style="list-style-type: none"> <li>•<b>Grammar and spelling:</b> Correction of technical errors.</li> <li><b>Readability:</b> Improving the flow and clarity of existing text.</li> <li><b>Language translation:</b> Facilitating conversion between languages to overcome language barriers.</li> <li><b>Brainstorming:</b> Generating lists of initial ideas or possible approaches.</li> </ul> <p><b>Key consideration</b> <i>Always ensure that AI edits reflect your own voice and critical thinking. For translations, double-check the results.</i></p>	<p><b>Approach:</b> AI assists in structuring, ideation, and synthesis. Its use is ethical only if humans rigorously supervise that the original meaning and intellectual authorship are not altered.</p> <p><b>Applications under strict supervision</b></p> <ul style="list-style-type: none"> <li><b>Schema generation:</b> Create structures based on content provided by the author.</li> <li><b>Content summary:</b> Summarize long texts provided by the researcher.</li> <li><b>Clarity improvement:</b> Rewrite complex sections to make them more understandable.</li> </ul> <p><b>Key consideration</b> <i>Ensure that the final product reflects your own ideas and knowledge, does not alter the key meaning, and aligns with the journal's requirements. Give appropriate credit for new ideas.</i></p>	<p><b>Approach:</b> AI replaces core cognitive functions of research, knowledge creation, or ethical judgment.</p> <p><b>Applications to avoid</b></p> <ul style="list-style-type: none"> <li><b>Writing text "from scratch" (de novo):</b> Generating manuscripts without prior input from the author.</li> <li><b>Development of new concepts:</b> Using AI to devise scientific hypotheses or theories.</li> <li><b>Data interpretation:</b> Delegating the analysis and conclusions of results to AI.</li> <li><b>Literature review:</b> Relying on AI to select and synthesize the state of the art (current knowledge on the subject).</li> <li><b>Critical judgment:</b> Using AI to determine ethical compliance or verify plagiarism.</li> </ul> <p><b>Key consideration</b> <i>These applications are considered ethically suspect, and the use of generative AI for these purposes is not recommended.</i></p>

Adapted from Cheng A, Calhoun A, Reedy G. Artificial intelligence-assisted academic writing: recommendations for ethical use. *Adv Simul (Lond)*. 2025;10(1):22.

critical review, fluency improvement, and orthotypographical correction.

- **Data:** Gemini for table compilation and formatting. ■

## REFERENCES

- Cheng A, Calhoun A, Reedy G. Artificial intelligence-assisted academic writing: recommendations for ethical use. *Adv Simul (Lond)*. 2025;10(1):22. doi: 10.1186/s41077-025-00350-6.
- Frangou S, Volpe U, Fiorillo A. AI in scientific writing and publishing: A call for critical engagement. *Eur Psychiatry*. 2025;68(1):e98. doi: 10.1192/j.eurpsy.2025.10061.
- Hryciw BN, Seely AJE, Kyeremanteng K. Guiding principles and proposed classification system for the responsible adoption of artificial intelligence in scientific writing in medicine. *Front Artif Intell*. 2023;6:1283353. doi: 10.3389/frai.2023.1283353.
- Giglio AD, Costa MUP da. The use of artificial intelligence to improve the scientific writing of non-native English speakers. *Rev Assoc Med Bras*. 2023;69(9):e20230560. doi: 10.1590/1806-9282.20230560.
- Granjeiro JM, Cury AADB, Cury JA, Bueno M, Sousa-Neto MD, Estrela C. The future of scientific writing: AI tools, benefits, and ethical implications. *Braz Dent J*. 2025;36:e256471. doi: 10.1590/0103-644020256471.
- Cohen JF, Moher D. Generative artificial intelligence and academic writing: friend or foe? *J Clin Epidemiol*. 2025; 179(111646): 111646. doi:10.1016/j.jclinepi.2024.111646.
- Yoo J-H. Defining the boundaries of AI use in scientific writing: A comparative review of editorial policies. *J Korean Med Sci*. 2025;40(23):e187. doi: 10.3346/jkms.2025.40.e187.
- Leung TI, de Azevedo Cardoso T, Mavragani A, Eysenbach G. Best practices for using AI tools as an author, peer reviewer, or editor. *J Med Internet Res*. 2023;25:e51584. doi: 10.2196/51584.
- Singh S, Kumar R, Maharshi V, Singh PK, Kumari V, Tiwari M, et al. Harnessing artificial intelligence for advancing

**TABLE 2. AI tools for scientific writing: access, costs, and functions**

Category	Tool	Website (URL)	Brief description
Assistance academic in writing	<b>ChatGPT</b> Free Plus USD 20/month	chatgpt.com	A tool for structuring ideas and improving narrative.
	<b>Claude</b> Free Pro USD 20/month	claude.ai	An effective writing assistant for long texts and argumentation.
	<b>Gemini</b> Free AI Pro USD 19.99/month	gemini.google.com	Text generation and refinement are integrated with the Google ecosystem.
Search and synthesis	<b>Elicit</b> Free (limited) Plus USD 12/month	elicit.com	A search engine that uses AI to find answers based on published works.
	<b>Consensus</b> Free (limited) Premium USD 8.99/month	consensus.app	A search engine for extracting evidence and scientific consensus.
	<b>Research Rabbit</b> Free RR+ USD 15/month (country discounts)	researchrabbit.ai	A visual tool for mapping author networks and related works.
	<b>NotebookLM</b> Free Plus (Google One AI Premium) USD 19.99/month	notebooklm.google.com	System for analyzing and synthesizing connections between your own documents (PDF).
Editing and correction	<b>Grammarly</b> Free Pro USD 12/month	grammarly.com	Grammar, spelling, and style correction for general writing.
	<b>Paperpal</b> Free (limited) Prime USD 25/month	paperpal.com	Editing assistant specifically trained with scientific manuscripts.
	<b>QuillBot</b> Free (limited) Premium USD 8.33/month	quillbot.com	A tool specializing in paraphrasing and summarizing texts.
Management and verification	<b>Mendeley</b> Free (2GB)/Premium from \$4.99/month	mendeley.com	Reference manager and academic social network for researchers.
	<b>Scite.ai</b> Free (limited) Premium USD 10-20/month	scite.ai	A platform for verifying whether a citation has been endorsed or verified by others.
	<b>Paperpile</b> From \$2.99/month (30-day free trial)	paperpile.com	Cloud management with integrated citation verification in the word processor.

**Security note:** We recommend checking the terms of use for each URL before uploading data. Proprietary document analysis tools (such as NotebookLM or Paperpile) may have varying policies regarding the use of user information for training public models vs. private environments.

**Note on costs:** The costs shown are for January 2026 and may vary by region and current promotions. We recommend checking each official website.

- medical manuscript composition: Applications and ethical considerations. *Cureus*. 2024;16(10):e71744. doi: 10.7759/cureus.71744.
10. White RR. Generative artificial intelligence tools in journal article preparation: A preliminary catalog of ethical considerations, opportunities, and pitfalls. *JDS Commun*. 2025;6(3):452–7. doi: 10.3168/jdsc.2024-0707.
11. Kacena MA, Plotkin LI, Fehrenbacher JC. The use of

- artificial intelligence in writing scientific review articles. *Curr Osteoporos Rep*. 2024;22(1):115–21. doi: 10.1007/s11914-023-00852-0.
12. Maddali MM. Pro: Artificial intelligence in manuscript writing: Advantages of artificial intelligence-based manuscript writing to the authors. *Ann Card Anaesth*. 2025;28(2):198–200. doi: 10.4103/aca.aca\_6\_25.
13. Drake JM, Han BA. How to write a scientific paper in

- 
- fifteen steps. *PLoS Comput Biol.* 2025;21(9):e1013505. doi: 10.1371/journal.pcbi.1013505.
14. Gravel J, Dion C, Fadaei Kermani M, Mousseau S, Osmanliu E. Will ChatGPT-4 improve the quality of medical abstracts? *Paediatr Child Health.* 2025;30(3):116–21. doi: 10.1093/pch/pxae062.
  15. Yousaf MN. Practical considerations and ethical implications of using artificial intelligence in writing scientific manuscripts. *ACG Case Rep J.* 2025;12(2):e01629. doi: 10.14309/crj.0000000000001629.
  16. Pinto DS, Noronha SM, Saigal G, Quencer RM. Comparison of an AI-generated case report with a human-written case report: Practical considerations for AI-assisted medical writing. *Cureus.* 2024;16(5):e60461. doi: 10.7759/cureus.60461.
  17. Thaichana P, Oo MZ, Thorup GL, Chansakaow C, Arworn S, Rerkasem K. Integrating artificial intelligence in medical writing: Balancing technological innovation and human expertise, with practical applications in lower extremity wounds care. *Int J Low Extrem Wounds.* 2025;15347346241312814. doi: 10.1177/15347346241312814.