Revista Española de Enfermedades Digestivas
The Spanish Journal of Gastroenterology

Title:
Domain-specific language models: innovation with inherent risks

Authors:
Julio Mayol, Marcos Gámez Alastuey, Rocío Anula Fernández

DOI: 10.17235/reed.2025.11224/2025
Link: PubMed (Epub ahead of print)

Please cite this article as:
Mayol Julio, Gámez Alastuey Marcos, Anula Fernández Rocío . Domain-specific language models: innovation with inherent risks. Rev Esp Enferm Dig 2025. doi: 10.17235/reed.2025.11224/2025.

Revista Española de Enfermedades Digestivas
The Spanish Journal of Gastroenterology

Domain-specific language models: innovation with inherent risks

Julio Mayol, Marcos Gámez Alastuey, Rocio Anula Fernández

Departament of General and Digestive Surgery. Hospital Clínico San Carlos. IdISSC. School of Medicine. Universidad Complutense de Madrid, Calle Martín-Lagos S/N 28040 Madrid

Corresponding author:

Julio Mayol jmayol@ucm.es

Keywords: Artificial intelligence. GenAI Healthcare Research Education Teaching Care delivery. Management.

Dear Editor:

We have read with great interest the reply by Navado Santos et al. (1) to our editorial in Revista Española de Enfermedades Digestivas (2). We agree with the potential advantages of domain-specific solutions, built by fine-tuning pretrained LLMs with healthcare data, but this approach has certain drawbacks we must not overlook, including:

Firstly, hallucinations. As noted by Anisuzzaman et al. (3), these solutions tend to generate non-existent responses more frequently, posing a significant risk for clinical decision-making.

Secondly, quality and biases. Clinical data used for fine-tuning can retain biases (3), and in certain medical specialties, the data may lack sufficient volume to enhance the quality and reliability of outputs compared to proprietary models like GPT-4 (4).

Thirdly, privacy. Clinical data often contain sensitive patient information (3), which raises privacy concerns.

In conclusion, the reliability of these results, the protection of patient data, and the accuracy of the responses are not yet fully assured. Addressing these challenges will require substantial investments in new professional roles for healthcare systems, alongside the creation and

maintenance of robust infrastructures, a task that many healthcare organizations, even in high income countries, may find difficult to undertake.

References

1. Nevado Santos M, Nevado Alvarez P. The Future of AI in Healthcare: Smaller, More Specialized Language Models. Rev Esp Enferm Dig. 2025.

2. Mayol J, Gámez Alastuey M, Anula Fernández R. Redefining healthcare - The transformative power of generative AI in modern medicine. Rev Esp Enferm Dig. 2025 Feb 3. doi: 10.17235/reed.2025.11081/2024. Epub ahead of print. PMID: 39898717.

3. Anisuzzaman DM, Malins JG, Friedman PA, Attia ZI. Fine-Tuning Large Language Models for Specialized Use Cases. Mayo Clin Proc Digit Health [Internet]. 2025 Mar 1 [cited 2025 Feb 8];3(1):100184. Available from: https://www.sciencedirect.com/science/article/pii/S2949761224001147

4. Maitin Ana M, Nogales A, Fernández-Rincón S, Aranguren E, Cervera-Barba E, Denizon-Arranz S, Mateos-Rodríguez A, García-Tejedor AJ. Application of large language models in clinical record correction: a comprehensive study on various retraining methods, *JAMIA 2025;* 32:341–348, https://doi.org/10.1093/jamia/ocae302