

EDITORIAL

AI in wine and haematology



© The Author(s), under exclusive licence to Springer Nature Limited 2024

Bone Marrow Transplantation; <https://doi.org/10.1038/s41409-024-02285-4>

'One of the disadvantages of wine is that it makes a man mistake words for thoughts.'

– Samuel Johnson, (1709–1784) English writer and essayist, Fig. 1.

Acronyms and abbreviations are undoubtedly useful but unfortunately can also lead to misinterpretation. The term AI has become ubiquitous and to younger people it equates to Artificial Intelligence. This was not always the case, however, and to many doctors AI stood for Artificial Insemination, which reminds me of the famous/infamous joke: the AI veterinary surgeon was coming to a farm to carry out artificial insemination. The female farmer met him and said: *'everything is ready, the cow is in the barn and there is a hook on the door for you to hang your trousers up!'* However, AI (Artificial Intelligence) was long in the making and as Deyan Sudjic, writing in the weekend FT [1] says: *'...there is rarely a single moment of innovation ...The reality is that innovation emerges from bursts of rapid innovation in different places and different minds.'*

My rather relaxed attitude to AI came into sharp focus recently. At a funeral, the daughter of the deceased spoke charmingly and poetically about her late father. I complimented her on the eulogy and she responded appropriately. It was sometime later that I was shocked to learn that her eulogy had been written by an AI programme!

Many of us, perhaps in older populations, are wary of AI and perceive a number of problems. Alice Lascelles, also [2] asks the question: *'Could an AI app sound the death knell of the wine expert? As she says; passing around the wine list in a restaurant in order to choose the wine apparently makes some people anxious.* This anxiety is probably true in some jurisdictions, but there may well be cultural variations, as it is probably less likely to cause anxiety in Italy or France than in countries where wine drinking is not commonplace. Lascelles writes that Pam Dillon CEO (another acronym!) of the wine app Preferabli, believes that AI could mitigate anxiety by choosing wine for the diner. Apparently, Dillon first had the idea in 2007 but, like many ideas, it had a long gestation (Fig. 2).

Of course, wine drinking should be an enjoyable experience and never induce anxiety and a little knowledge can be very helpful. As I and many other commentators have frequently pointed out, context is very important. A glass of wine consumed on a moonlit evening in Tuscany when the temperature is in the mid-70s certainly does not taste the same as a similar glass on a wet, misty day in February in Dublin. Hopefully, AI will never be able to define context. The other thing AI, hopefully, will never do, is make a recommendation which includes 'bottle variation' [3]. This

phenomenon is happily fairly uncommon but refers to the distinct variation in taste between bottles of similar wine from the same vineyard. As is often said: *there is no such thing as a great wine only a great bottle.*

Before delving into AI in haematology perhaps it would be a good idea to look at the meaning of AI. AI relies on digitised data and refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems. So far so good but does AI have a role in haematology? If you believe that internal medicine is simply the diagnosis and treatment of disease then you probably don't believe the words of the eminent Canadian physician Sir William Osler (1849–1919) who said (among other things): *'The good physician treats the disease, and the great physician treats the patient who has the disease'*. Osler was one of the founding professors of Johns Hopkins Hospital and creator of the first residency programme for speciality training of physicians. He viewed medicine as *'... a science of uncertainty and an art of probability'*. It may well be that AI will assist physicians in making a diagnosis but it hopefully will never replace the doctor-patient relationship!

What about the role of AI in haematology? Since Alan Turing invented the computer during World War II (1939–45) working as a code-breaker in Bletchley Park in the UK, there has been a steady increase in the development and use of AI in many walks of life. We frequently use AI subconsciously. Although AI may provide many advantages it has its downside, for example, cyberbullying, use of misinformation, and incorrect attribution of opinions held by prominent individuals leading to major scandals. Camilla Hodgson (San Francisco) writing in the FTWeekend, [4] claims that the large Tech companies are aware that the possibility of misinformation may have a large effect on the outcome of national elections, stating that; *'deceptive content could jeopardise the integrity of electoral processes'*. Although large Tech companies have promised to minimise the possibility of misinformation, some of us are sceptical of the efficacy of their promise. Misinformation or dissimulation is not new and was mentioned by Tacitus (Roman historian and politician) Fig. 3 and probably others before him, but it is undoubtedly easier to spread misinformation in the age of the mobile phones and social media than it was thousands of years ago.

An expression that is commonly linked to AI is 'algorithm'. Many people seem to believe that 'algorithm' is a new word, but most of us have been using diagnostic algorithms, often subconsciously, for many years. My book [5], for example, published in 2009, used algorithms after each clinical case. A recent paper by Walter W et al. [6] titled: *'How artificial intelligence might disrupt diagnostics in haematology in the near future'* is of interest and highly informative. There are clearly two issues for haematologists: can AI help to make an accurate diagnosis and can AI be used for teaching doctors and technologists?

A number of terms are widely used in the AI literature, 'deep learning' (DL), the use of neural networks to learn an abstract representation of complex data sets, and 'machine learning' (ML),

Received: 27 March 2024 Revised: 7 April 2024 Accepted: 8 April 2024
Published online: 16 April 2024

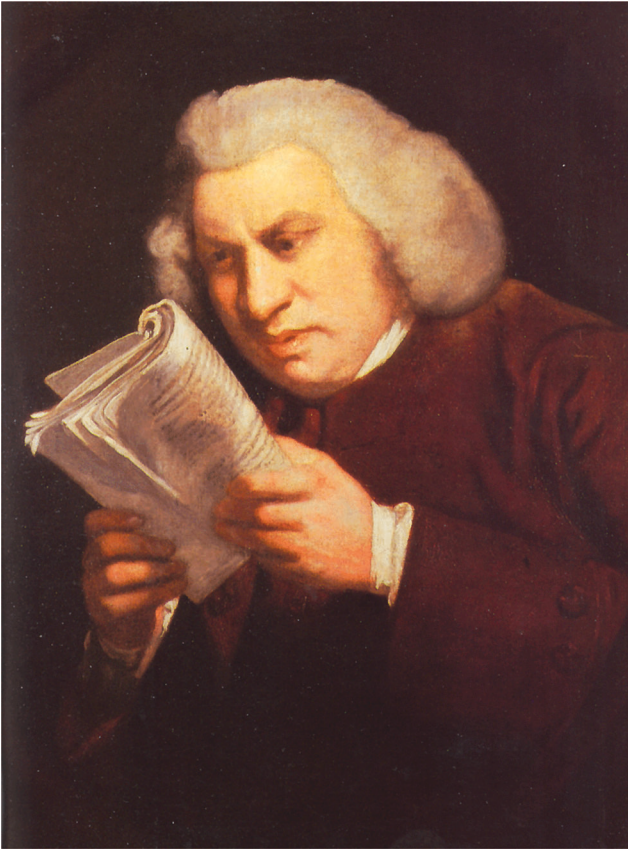


Fig. 1 Portrait of Samuel Johnson by Joshua Reynolds 1775. Public Domain.



Fig. 2 Alan Turing. Plaque commemorating the birth of Turing. Source Wikipedia.

which is recognition of patterns and associations. AI may be particularly useful in the diagnosis of malignant haematological




Fig. 3 The title page of Justus Lipsius's 1598 edition of the complete works of Tacitus, bearing the stamps of the Bibliotheca Comunale in Empoli, Italy. Source Wikipedia.

disorders which include cytomorphology, cytogenetics, immunophenotyping and molecular genetics and in some laboratories, next-generation sequencing (NGS). A more accurate diagnosis may indicate more effective therapy. However, the application of AI to CBC analyses and red blood cell morphology does not appear to be as well advanced as the analysis of malignant haematological disorders. Perhaps RBC morphology is too subtle for AI analysis! However, there is no doubt that AI is here to stay in haematology but as stated in Walter's paper '*regulated integration of new applications is important to ensure that patients are neither exposed to flawed interventions with potentially harmful effects or denied access to beneficial interventions.*'

Tim Harford writing a rather humorous article in the FT Weekend magazine [7] discusses GPT-4 (Generative Pre-Trained Transference 4) a multimodal large language model created by Open AI. He points out that although GPT-4 cannot count, it can integrate complex mathematical formulae! In the same article, he writes: '*sometimes the AI is better than you, and sometimes you are better than the AI, good luck guessing which is which.*' He finishes by saying: '*will we do a better job with the AI tools to come?*'

Whatever the future holds I hope you continue to enjoy drinking wine and that AI will enhance haematology in many different ways.

Shaun R. McCann ¹ 

¹*Bone Marrow Transplantation*, <https://www.nature.com/bmt/>.
Shaun McCann is the sole author and responsible for all the ideas
and writing.  email: shaunmccann@gmail.com

REFERENCES

1. Sudjic D. They were the future once. Weekend FT. Bracken House, 1, Friday Street. London. UK: The Financial Times Limited; 2024.
2. Lascelles Alice. I, sommelier. Weekend FT. FT.COM/HTSI. Bracken House, 1, Friday Street. London. UK: The Financial Times Limited; 2024.
3. Robinson J, Harding J, Dick B. Bottle variation. The Oxford Companion to Wine. In: J Robinson, editors. 4th ed. Oxford University Press: Oxford, UK; 2023.

4. Hodgson C. Big tech vows to fight bogus electoral AI content. FTWeekend. Bracken House, 1 Friday Street. London EC4M 98T, UK: Financial Times; 2024.
5. McCann S, Foà R, Smith O and Conneally E. Clinical cases uncovered; haematology. Wiley-Blackwell. 2009. ISBN 978-1-4051-8322-2
6. Walter W, Haferlach C, Nadarajah N, Schmidts I, Kühn C, Kern W, Haferlach T. How artificial intelligence might disrupt diagnostics in haematology in the near future. *Oncogene*. 2021;40:4271–80. <https://doi.org/10.1038/s41388-021-01861-y>.
7. Harford T. Stumbling over the jagged frontier of AI. FT.Com/magazine. Bracken House, 1, Friday Street. London. UK: The Financial Times Limited; 2024.

COMPETING INTERESTS

The author declares no competing interests.