

AI Overload

By Philip A. Baer, MDCM, FRCPC, FACR

Artificial intelligence (AI) and the associated AI-related hype seem to be everywhere. Are the robots taking over? Will they outsmart us? Will knowledge workers' jobs, including those of rheumatologists and other physicians, be threatened?

In 2016, Canadian machine-learning pioneer Geoffrey Hinton spoke at a machine-learning conference in Toronto and said: "I think if you work as a radiologist, you are like the coyote that's already over the edge of the cliff but hasn't yet looked down. People should stop training radiologists now. It's just completely obvious within five years deep learning is going to do better than radiologists.... It might be 10 years, but we've got plenty of radiologists already."¹

Rheumatologists were not mentioned, and as of 2023 Hinton appears to be incorrect about radiologists, but what are the implications for us?

Evidence-based medicine is one of our cornerstones, so let's examine the evidence. ChatGPT and other large language models (LLMs) seem to have impressive capabilities. They can write code, create reports and letters, and apparently can pass some medical licensing exams. However, an AI candidate failed a mock radiology fellowship examination recently, struggling the most with musculoskeletal imaging.² As well, AI chatbots cannot always be trusted, as they "hallucinate" by inventing "facts" and references which are false. They may violate copyrights and privacy and plagiarize the material they review. Ethical AI is not the current reality. The current iteration of ChatGPT was apparently trained on what it could find online up to 2021, so newer research will not be incorporated into its work product.

Medical journal editors are concerned enough to limit the use of AI in producing papers and require the disclosure of AI assistance in generating submissions. Can an AI program be listed as the author of a medical paper? Currently, the answer is no.³ Yet there are already reports of a corporate board including an AI program named VITAL as a board member.⁴ Advantages: perfect attendance, reliable completion of pre-reading, and no costs to feed it.

I reviewed studies related to rheumatology uses of AI presented at EULAR 2023 for a recent presentation. The field is burgeoning, with a literature search indicating an annual increase in papers citing AI of between 20 and 48 percent (Abstract AB1667). Multiple studies support the usefulness of AI in reporting of imaging studies, using convolutional neural networks (CNNs) developed with training sets followed by testing on validation sets. The CNNs did as well as expert readers in multiple

studies: hand/wrist X-rays looking at Sharpe/van der Heijde scores in rheumatoid arthritis (RA) (POS0160), RAMRIS scoring of hand MRIs in RA (OP0002) and scoring of X-rays (POS0896) and MRIs (AB1013) for sacroiliitis in axial spondyloarthritis. LLMs using natural language processing (NLP) could review patient data in EMRs and EHRs and find previously unsuspected cases of ANCA-associated vasculitis (POS1179). Models could also be constructed in RA to evaluate baseline factors and predict outcomes one year into the future, potentially selecting some patients for more intensive follow-up and treatment if the prediction was for high disease activity in the future (POS0320).

Meanwhile, what happened in radiology since Hinton pronounced it was doomed in 2016? Well, there are now 200 FDA-approved radiology AI algorithms ready for use, according to the American College of Radiology's AI Central site. At the same time, there is a global radiologist shortage, driven in part by overwork. "The amount of imaging is going up 5 percent per year, and we're not training 5 percent more radiologists per year," according to Jordan Perchik, MD, a fellow in the Department of Radiology at the UAB Heersink School of Medicine. "The most commonly used AI tools," Perchik said, "are ones that speed up scans, paradoxically increasing the workload for radiologists."⁵

Hinton has also been rebutted by Stanford radiologist and AI pioneer Curtis Langlotz, MD, PhD. He said, "AI won't replace radiologists, but radiologists who use AI will replace those who don't."⁶ Maybe that is what rheumatologists can glean from all the AI hype. Our brand of longitudinal holistic care will never be obsolete, but we may have to integrate AI tools to cope with the increasingly severe mismatch between supply and demand we are faced with.

Now, please excuse me while I follow the advice of the legacy AI troika of Alexa, Siri and Cortana and invest all my spare cash in Amazon, Apple and Microsoft.

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