

# Artificial intelligence and the family physician

Nicholas Pimlott MD PhD CCFP FCFP, SCIENTIFIC EDITOR



*We had better be quite sure that the purpose put into the machine is the purpose which we really desire.*

Norbert Wiener

**H**uman beings are terrible at predicting the long-term consequences of technological change. The third agricultural revolution of the mid-20th century, for example, was predicted to reduce poverty, infant mortality, greenhouse gas emissions, and land use for agriculture.<sup>1</sup> Unforeseen was its contribution to the growth of the fast-food industry, a global epidemic of obesity and type 2 diabetes mellitus,<sup>2</sup> and a loss of biodiversity, to name just a few negative outcomes.

More than a decade ago, electronic medical records were viewed as an innovation that would lead to more efficient, effective, and equitable care, and could lead advances in quality improvement and population health. However, it would result in physicians spending less time with their patients than in the days of paper charts,<sup>3</sup> and an epidemic would arise of physician burnout and dissatisfaction, especially among primary care physicians.<sup>4</sup>

Dr Stuart Russell, Professor of Computer Science and founder of the Center for Human-Compatible Artificial Intelligence at the University of California in Berkeley, the 2021 BBC Reith Lecturer,<sup>5</sup> and one of the world's leading experts on artificial intelligence (AI) has argued that we are on the brink of the most profound technological change in human history as we come to rely more on AI. He has also best articulated the principles on which human-AI compatibility should be grounded.<sup>6</sup>

But the AI revolution in medicine and almost all other aspects of human life is well under way. Drs Winston Liaw and Ioannis Kakadiaris explain that "AI can already execute complicated multistep tasks historically performed by physicians, such as generating differential diagnoses and recommending treatment plans based on the best available evidence."<sup>7</sup> They argue that the AI revolution is already taking place in medicine and that it is doing so without the engagement of FPs.<sup>7,8</sup> This lack of engagement, they say, is reflected in the dearth of publications about AI in leading family medicine research journals. An archive search of *Canadian Family Physician (CFP)* reveals a similar paucity of AI content. They make a strong case for greater engagement of the profession with AI scientists and scholars in our universities and

communities, and call for AI papers in our journals and AI plenary speakers at our conferences. This is essential if we are to minimize the consequences of electronic medical record implementation.

The CFPC has shown timely leadership in engaging family medicine with AI, beginning with the 2019 Leaders Forum that brought together FPs, family medicine leaders, and experts in AI.<sup>9</sup> More recently, the CFPC, working with the Foundation for Advancing Family Medicine and AMS Healthcare, created the first TechForward Fellow. The first Fellow is Jacqueline Kueper, a computer science and epidemiology PhD candidate at Western University in London, Ont. This year Ms Kueper will provide insight and perspective on AI, medical technology, and compassionate care in the CFPC's work, including *CFP*. In this issue of *CFP*, we are pleased to publish Ms Kueper's primer on AI that we hope will be the beginning of an ongoing conversation (**page 889**).<sup>10</sup>

Drs Liaw and Kakadiaris provide a hopeful vision of the outcome of ongoing engagement between FPs and AI scientists—that human physicians and machines will complement each other in their work and will enhance human interactions and make the time we spend with our patients more meaningful.<sup>6</sup> Humans are still at the centre of primary care; effective teams and communication need to be fostered and supported.<sup>11,12</sup> There is a long way to go before AI improves our practices. Now is the time that we, as FPs, must put into the machine the purpose we really desire. 🌱

The opinions expressed in editorials are those of the authors. Publication does not imply endorsement by the College of Family Physicians of Canada.

## References

1. Green revolution. Los Angeles, CA: Wikipedia Foundation Ltd; 2021. Available from: [https://en.wikipedia.org/wiki/Green\\_Revolution](https://en.wikipedia.org/wiki/Green_Revolution). Accessed 2021 Nov 12.
2. Unnikrishnan R, Pradeepa R, Joshi SR, Mohan V. Type 2 diabetes: demystifying the global epidemic. *Diabetes* 2017;66(6):1432-42.
3. Young RA, Burge SK, Kumar KA, Wilson JM, Ortiz DF. A time-motion study of primary care physicians' work in the electronic health record era. *Fam Med* 2018;50(2):91-9.
4. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc* 2015;90(12):1600-13. Erratum in: *Mayo Clin Proc* 2016;91(2):276.
5. Russell S. *Reith Lectures 2021—living with artificial intelligence*. London, UK: BBC; 2021. Available from: <https://www.bbc.co.uk/programmes/articles/1N0w5NcK27T041PVL251k/reith-lectures-2021-living-with-artificial-intelligence>. Accessed 2021 Nov 3.
6. Russell S. *3 principles for creating safer AI* [video]. San Bruno, CA: YouTube; 2017. Available from: <https://www.youtube.com/watch?v=EBK-a94IFHY&t=331s>. Accessed 2021 Nov 4.
7. Liaw W, Kakadiaris IA. Artificial intelligence and family medicine: better together. *Fam Med* 2020;52(1):8-10.
8. Liaw W, Kakadiaris IA. Primary care artificial intelligence: a branch hiding in plain sight. *Ann Fam Med* 2020;18(3):194-5.
9. Pimlott N. Family physicians of the future redux. The robot will see you now? *Can Fam Physician* 2019;65:454 (Eng), 455 (Fr).
10. Kueper JK. Primer for artificial intelligence in primary care. *Can Fam Physician* 2021;67:889-93 (Eng), e317-22 (Fr).
11. Fletcher FC, Humphrys E, Bellwood P, Hill TT, Cooper IR, McCracken RK, et al. Team-based care Evaluation and Adoption Model (TEAM) framework. Supporting the comprehensive evaluation of primary care transformation over time. *Can Fam Physician* 2021;67:897-904.
12. Perri GA, Lewin WH, Khosravani H. Team debriefs during the COVID-19 pandemic in long-term care homes. Essential elements. *Can Fam Physician* 2021;67:908-10.

*Can Fam Physician* 2021;67:879 (Eng), 881 (Fr). DOI: 10.46747/cfp.6712879

Cet article se trouve aussi en français à la **page 881**.