Technology and Humanity

New technologies have brought immeasurable benefits to medicine. They have also altered our patients' experiences and our role as providers in significant ways. To give you an example, my patient sessions often start with me madly clicking away in the electronic health record (EHR), trying to reconcile three duplicate instances of the same medication in the patient's chart. After that maze, a series of pop-up boxes flash alerts to query the patient about weight, smoking, depression, and pain. I am now clicking as fast as I can to preserve any remaining time in the 15-minute session to address the patient's cancer. And, all of this is happening with my back to the patient!

With experiences like that, it is hard not to feel some trepidation as the next new technology, artificial intelligence (AI), enters the healthcare setting. However, I feel that AI can transform the practice of oncology in various ways and bring some exhilarating challenges.

- Digital pathology and automated image analysis, coupled with deep learning neural networks, can empower pathologists to more accurately review and analyze a greater volume of histopathology images, establish diagnoses, and identify different cancer tissues, subtypes, markers, and expression scores. This results in better prediction of cancer behavior (Khosravi, Kazemi, Imielinski, Elemento, & Hajirasouliha, 2017).
- AI can be used to create dynamic, longitudinal patient histories from multiple data sources, including demographic and disease information. AI can review enormous repositories of literature and evidence relevant to specific patients, freeing oncologists from this labor-intensive process (Simon et al., 2018).
- Repetitive clerical tasks (many spawned by the EHR) that monopolize so much clinical time could be streamlined. Deep learning can focus the clinical workflow, eliminate or reduce administrative tasks, and liberate clinicians to spend precious minutes with the actual patient (Verghese, Shah, & Harrington, 2017).
- Healthcare organizations are implementing deep learning to improve logistics, integrate disparate systems, and provide quality control, financial oversight, drug procurement, and scheduling (Naylor, 2018).

> "Oncology is an area of medicine where human contact and empathy are essential."

All healthcare specialties require empathetic providers. However, oncology is an area of medicine where human contact and empathy are essential. Patients are staring point-blank at their own mortality. They are facing alarming diagnoses, sometimes getting the news in just a few days. While coping with anxiety and fear, they must assimilate a lot of information and make intelligent decisions spontaneously. They deal with treatment side effects, the therapeutic roller coaster of successes and disappointments, family reactions, advance planning, and more. It is critical that patients feel a human connection with their clinician.

I join many who ask how we can direct AI to create meaningful patient interactions that allow for eye-to-eye contact, questions and answers, time to understand illnesses and therapies, and to articulate all concerns—logistical and emotional. And, shouldn't we do this before bottom line forces hijack these new technologies, emphasizing productivity rather than humanity in patient care? It would be wonderfully ironic if AI brings humanity back to health care by relieving clinicians of tasks that are the least about who we are and what we do best.

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REFERENCES

Khosravi, P., Kazemi, E., Imielinski, M., Elemento, O., & Hajirasouliha, I. (2017). Deep convolutional neural networks enable discrimination of heterogeneous digital pathology images. *EBioMedicine, 27,* 317–328.

Naylor, C.D. (2018). On the prospects for a (deep) learning health care system. *JAMA, 320,* 1099–1100.

Simon, G., DiNardo, C.D., Takahashi, K., Cascone, T., Powers, C., Stevens, R., . . . Chin, L. (2018). Applying artificial intelligence to address the knowledge gaps in cancer care. *Oncologist, 23,* 1–11.

Verghese, A., Shah, N.H., & Harrington, R.A. (2017). What this computer needs is a physician. Humanism and artificial intelligence. *JAMA, 319,* 19–20.

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