

# Technology and the Ideal Future State of Oncology

BY DAVID R. PENBERTHY, MD, MBA



**O**n February 15, 2023, I hosted my final Tech Talk: “The Impact of Big Data and Artificial Intelligence on Oncology.” More than 40 ACCC members attended this live event

to listen and participate in an interactive discussion with our four distinguished panelists: Blythe Adamson, PhD, MPH, principal scientist, Flatiron Health; Rick Baehner, MD, chief medical officer, Precision Oncology, Exact Sciences; John Frownfelter, MD, FACP, lead, Data Driven Healthcare, NTTData; and Sarah McGough, PhD, senior data scientist, Genentech.

Dr. Baehner kicked off our discussion with the role big data plays in cancer diagnostics. As a practicing pathologist, he addressed the need to validate cancer diagnostic assays, like next-generation sequencing, to ensure their usability and efficacy in clinical practice. With the creation of the Oncotype DX Breast Recurrence Score®, Dr. Baehner’s team completed several clinical validation trials over a 10-year period. Since, this assay has been used for more than 1.5 million people to inform treatment decisions.

Dr. Frownfelter was up next, with new and timely technologies that have enormous potential to positively disrupt the way we deliver healthcare today—from remote patient management (more than patient monitoring) to the digital human and OpenAI’s Chat GPT. According to Dr. Frownfelter, the digital human is innovating interactions between humans and technology. “If you combine this [the digital human] and...Chat GPT and generative AI...then you’ve got an avatar that’s interacting in a very human-like way with the data built into it [the avatar] to inform how it responds,” Dr. Frownfelter enthused, adding that “the case for health literacy is pretty strong.” This technology can help reduce medication errors, hospitalizations, and,

ultimately, mortality because people may be in a better position to receive optimal care when they present to the ED or hospital.

I then passed the baton to Dr. McGough to explain why investment in data and advanced analytics can transform drug development. In using health databases, companies like Genentech are given the big picture of the real-world patient—their clinical history and tumor genomic profile—which informs the development of targeted therapies. “We no longer have to study cancer in silos because these databases contain dozens of different cancer types and tens of thousands of patients,” she said. Machine learning helps identify the most important predictors of survival across various cancer types and patient populations. “We can train machine learning models to predict survival using thousands of clinical and genomic variables that we can obtain from patient health records,” Dr. McGough said. This technology can risk stratify patient populations and help inform treatment decisions in the clinic.

Wrapping up the day’s discussion, Dr. Adamson shared a picture of her team. “Together we are building these large language models that are able to read things in a similar way,” she said. Affirming that technology will never fully replace providers, Dr. Adamson shared that technology’s role will be to assist providers in quickly identifying the important biomarker a patient may have to inform treatment decisions. To do so, the ideal future state will require teams of engineers, healthcare professionals, researchers, and more, working together to innovate and fully implement these technologies in the clinic.

If you missed this forward-thinking conversation, listen to the on-demand recording of this Tech Talk at [accc-cancer.org/techtalks](https://accc-cancer.org/techtalks).

As my 2022-2023 presidency ends, I am proud of the many real-world examples ACCC has shared of its member programs and practices leveraging technology to transform cancer care delivery and the patient experience. I look forward to continuing this journey with you. The future is bright! 

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- ▶ Chemotherapy Care Companion:  
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- ▶ Deploying Technology Across an Interdisciplinary Team to Improve Oral Oncolytic Compliance
- ▶ Interprofessional Collaboration with EHR to Optimize Oncology Navigation Efficiency and Value
- ▶ Supportive Oncology in Lung Cancer: Program Development for Patients and Care Partners
- ▶ Comprehensive Cancer Risk Management Clinic for Families with Hereditary Cancer Syndromes
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