Watson Will See You Now: A Supercomputer to Help Clinicians Make Informed Treatment Decisions

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IBM has collaborated with several cancer care providers to develop and train the IBM supercomputer Watson to help clinicians make informed treatment decisions. When a patient is seen in clinic, the oncologist can input all of the clinical information into the computer system. Watson will then review all of the data and recommend treatment options based on the latest evidence and guidelines. Once the oncologist makes the treatment decision, this information can be sent directly to the insurance company for approval. Watson has the ability to standardize care and accelerate the approval process, a benefit to the healthcare provider and the patient.

At a Glance
• Cognitive technology will increasingly play a role in cancer care.
• Cognitive technology is being used and refined by various comprehensive cancer centers around the United States.
• This new technology has the potential to provide all clinicians working in oncology with the latest practice guidelines and clinical trial availability.

The two best Jeopardy! players the show ever had, Brad Rutter and Ken Jennings, took on a supercomputer named Watson, developed by IBM and named after the company’s founder, Thomas Watson. The two contestants lost to Watson in 2011 by a large margin, and Jennings said in his final answer, “I for one welcome our new computer overlords” (Ratzule, 2011).

The supercomputer Watson was not connected to the Internet at the time of the match. Watson generated a response using information that it had accumulated as well as statistical analysis. At the time of the Jeopardy! game, Watson was the size of a master bedroom and had to be kept apart from its competitors because of the noise generated from its cooling system. That same year, IBM executives discussed the possibility of using this same technology in health care (IBM Watson, 2014b).

What is IBM Watson?

IBM Watson is a cognitive technology that processes information similarly to a human by understanding natural language and analyzing unstructured data. When Watson is asked a question, it relies on hypothesis generation and evaluation to quickly analyze the evidence and, through repeated use, Watson continually gets smarter by tracking the feedback from its users and learning from success and failure (IBM Watson, 2014b).

IBM Watson and Memorial Sloan Kettering Cancer Center Collaboration

In 2012, IBM partnered with Memorial Sloan Kettering Cancer Center (MSKCC). The goal of this collaboration was to bring the supercomputer to healthcare providers, allowing personalized patient care through computer-generated identification of the most up-to-date,
Clinical Oncology annual meeting that reviewed the accuracy of the OEA system by comparing its treatment suggestions with those of University of Texas MD Anderson Cancer Center physicians. The system has a false positive if it recommends an incorrect answer with high confidence; it has a false negative if it recommends a correct answer with low confidence. When the OEA treatment recommendations of 200 leukemia cases were reviewed, the system had a false positive rate of 2.9% and a false negative rate of 0.4%. The overall accuracy of the standard of care recommendations was 82.6% (American Society of Clinical Oncology, 2014). One issue the cognitive computer system encountered was variation of nonstandard terminology or acronyms by individual physicians making it difficult to read the source documents. The future for the OEA looks promising. OEA is expected to be accessible to the cancer center’s network of clinicians through a computer interface and supported by mobile devices. A long-range goal is to share this technology with oncologists worldwide (University of Texas MD Anderson Cancer Center, 2014).

IBM and WellPoint, Inc. Collaboration

In 2011, IBM had also partnered with one of the largest for-profit managed healthcare companies, WellPoint, Inc., to develop a technology that streamlines the review process for medical treatments. Throughout the use management pilot, WellPoint, Inc. nurses put in more than 14,700 hours of hands-on training, using 25,000 test-case scenarios and 1,500 real-life cases to train the supercomputer to review authorization requests for procedures and treatments. WellPoint, Inc. is calling its new system the Cancer Care Quality Program. This program incentivizes oncologists for choosing evidence-based treatment options. As of July 2014, this program exists in Indiana, Kentucky, Missouri, Ohio, Wisconsin, and Georgia. By early to mid-2015, this program will also exist in New York, Connecticut, Maine, New Hampshire, and Virginia (IBM Watson, 2013; Verdon, 2014).

Conclusion

Watson has the ability to dramatically change the way in which cancer care is prescribed through its ability to answer complex questions with speed, accuracy, and increasing confidence. Information can be processed quickly through a system that includes the healthcare provider and health insurance companies. This could lead to a faster and easier authorization process. Future benefits could include the ability to match patients to clinical trial opportunities and possibly gather data that may lead to the development of new clinical trials. The hope is that this tool will increase the number of patients receiving the most evidence-based treatment and minimize the current variability of treatment decisions that exist today.

References