'Jeopardy!'-winning computer delving into medicine

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This Jan. 13, 2011 photo provided by IBM shows the IBM computer system known as Watson at IBM's T.J. Watson research center in Yorktown Heights, N.Y. Watson, best known for handily defeating the world's best "Jeopardy!" players on TV earlier this year, is on a diet of medical textbooks and journals for health care. IBM says Watson, with its ability to understand plain language, can digest questions about a person's symptoms and medical history and quickly suggest diagnoses and treatments. (AP Photo/IBM)

Some guy in his pajamas, home sick with bronchitis and complaining online about it, could soon be contributing to a digital collection of medical information designed to help speed diagnoses and treatments.

A doctor who is helping to prepare IBM's Watson computer system for work as a medical tool says such blog entries may be included in Watson's database.

Watson is best known for handily defeating the world's best "Jeopardy!" players on TV earlier this year. IBM says Watson, with its ability to understand plain language, can digest questions about a person's symptoms and medical history and quickly suggest diagnoses and treatments.

The company is still perhaps two years from marketing a medical Watson, and it says no prices have been established. But it envisions several uses, including a doctor simply speaking into a handheld device to get answers at a patient's bedside.

Watson won't be the first such product on the medical market, however, and one rival company says it isn't impressed.

At a recent demonstration for The Associated Press, Watson was gradually given information about a fictional patient with an eye problem. As more clues were unveiled - blurred vision, family history of arthritis, Connecticut residence - Watson's suggested diagnoses evolved from uveitis to Behcet's disease to Lyme disease. It gave the final diagnosis a 73 percent confidence rating.

"You do get eye problems in Lyme disease but it's not common," Dr. Herbert Chase said. "You can't fool Watson."

For "Jeopardy!" Watson was fed encyclopedias, dictionaries, books, news, and movie scripts. For health care, it's on a diet of medical textbooks and journals. It could also link to the electronic health records that the federal government wants hospitals to maintain. Medical students are peppering it with sample questions to help train it.

Chase, a Columbia University medical school professor, says anecdotal information - such as personal blogs from medical websites - may also be included.

"What people say about their treatment ... it's not to be ignored just because it's anecdotal," Chase said. "We certainly listen when our patients talk to us, and that's anecdotal."

Chase and other experts say cramming Watson with the latest medical information will help with a major problem in modern health care: information overload.

"For at least 30 years it's been clear that it's not possible for us to know everything," he said. "Every day, doctors have questions they can't find the answers to. Even if you sit down at a search engine, it's so labor intensive and it takes so long to find answers."

Carl Kesselman, director of the Health Informatics Center at the University of Southern California, says the "deluge of information" is a significant problem.

"Advances in medicine are increasing rapidly: genomics, specialized drugs, off-label uses, increasingly finer-grained classifications of disease," said Kesselman, who is not involved with the Watson project. "The ability to ask `Jeopardy!'-style questions and get that kind of information retrieval, to sort through all the stuff out there and point you to the latest literature, would be of potentially huge value."

Michael Yuan, chief scientist at Ringful Health, a medical consulting company in Austin, Texas, that has worked with IBM, cited a 1999 study of 103 doctors that found they fielded more than 1,100 questions a day, of which 64 percent were never answered.

"That's a huge potential for people to make mistakes," he said. "Watson is the type of solution that can really reduce that."

In "Jeopardy!" Watson was asked for one correct answer, whether it was

answering questions about Sir Christopher Wren, the Lion of Nimrud or the Church Lady from "Saturday Night Live."

But in its medical guise, when presented a set of symptoms, Watson offers several possible diagnoses, ranked in order of its confidence.

"In medicine, we don't want one answer, we want a list of options," Chase said.

Kesselman said having options might help doctors accept a computer's findings.

"Will a physician ever blindly accept a diagnosis coming out of a computer? I don't think that will happen anytime soon," he said.

Chase said seeing more than one choice might also help doctors move away from what he called "anchoring," or getting too attached to a diagnosis.

"If a person has a 95 percent chance of having disease X, there's still a one-in-20 chance that they have something else," he said. "We often forget what's in that 5 percent. But Watson won't."

The treatment application works much like the diagnosis application. In the demonstration, Watson first suggested the antibiotic doxycycline for treating Lyme disease, then switched to cefuroxime when told the patient was pregnant and allergic to penicillin.

Chase said Watson will know the latest treatment guidelines - which are complex and often updated - "and can see if they're not being met."

"You have to match the right treatment with each unique patient," Chase said. "You can't treat everybody with high blood pressure the same way -

a 75-year-old man with prostate cancer who felt dizzy last week and a 32-year-old woman."

Yuan said Watson's influence will depend on "how widely it is adopted."

"You have to wonder if a hospital is going to plunk down a couple of million dollars," he said.

IBM's Dan Pelino, general manager for global health care, said clients won't have to buy a complete Watson system. He said possible future uses include:

- Allowing a doctor to connect to Watson's database by speaking into a hand-held device, using speech-recognition technology and cloud computing;

- Serving as a repository for the most advanced research in cancer or other fields;

- Providing an always-available second opinion.

"You can imagine someone asking Watson a question on an iPad as they're walking down the hall," Chase said. "It might get updates like a GPS."

An existing private medical database known as Isabel is already used by some multi-hospital health systems. Co-founder Jason Maude of Isabel Healthcare said that from what he's heard about IBM's plans for Watson, "It's kind of what we've had for about 10 years."

An online demonstration of Isabel showed similarities to the Watson model - symptoms are entered, and the computer searches through a database for a possible diagnosis. Maude, who named Isabel for a

daughter who escaped a serious misdiagnosis as a child, says Isabel's database has been "tuned and honed" over time.

He said prices for using Isabel range from a few thousand dollars a year for a family practice to as much as $400,000 for a health system.

Pelino said Watson is much faster and Chase said Watson is better at understanding non-medical terms.

"Watson knows that `difficulty swallowing' is `dysphagia,'" he said.

Isabel has been used at the Orlando Health hospital network in Florida since last fall, and "has had its successes," said Dr. Jay Falk, chief academic medical officer. He said less experienced doctors use it under the guidance of senior clinicians "who can make some judgments about the likelihood of what's given on the list of diagnoses."

"There's no question that there's a need for a tool that will help in this regard," Falk said. "Whether Isabel itself is the answer is unclear." Overall, he said, "We're enjoying learning with it."

IBM said Watson can answer some medical questions in the same few moments it took on "Jeopardy!" Yuan noted studies have shown that "If it takes more than two minutes, it won't get used."

As on "Jeopardy!" - where Watson identified Toronto as a U.S. city and Picasso as an art period - the computer occasionally bungles a medical question.

"I think once we were asking what type of drug we should use and the answer was a person's name," Chase said. "In fairness, I think it was a person associated with the drug."

And of course there are things Watson cannot do. It won't know a patient's appetite for risk, for example, or feelings about end-of-life treatment.

"That's why you have to emphasize that the decisions aren't coming from the computer, they're coming from the patient," Chase said.

Chase's suggestion that medical blogs be included may have something to do with his own medical history.

Several years ago, fighting a cholesterol problem, he took Lipitor and was soon plagued with insomnia. He suspected a connection but found nothing in textbooks or journals.

"I go to the blogosphere, and it was like, `You moron, don't take Lipitor before you go to bed because you'll never sleep again!'

"Now it's five years later, and if you Google Lipitor and insomnia, it's all over the place," Chase said.