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For Second Opinion, Consult a Computer?

SAN FRANCISCO — The man on stage had his audience of 600 mesmerized. Over the course of 45 minutes, the tension grew. Finally, the moment of truth arrived, and the room was silent with anticipation.

At last he spoke. "Lymphoma with secondary hemophagocytic syndrome," he said. The crowd erupted in applause.

Professionals in every field revere their superstars, and in medicine the best diagnosticians are held in particularly high esteem. Dr. Gurpreet Dhaliwal, 39, a self-effacing associate professor of clinical medicine at the University of California, San Francisco, is considered one of the most skillful clinical diagnosticians in practice today.

The case Dr. Dhaliwal presented, at a medical conference last year, began with information that could have described hundreds of diseases: the patient had intermittent fevers, joint pain, and weight and appetite loss.

To observe him at work is like watching Steven Spielberg tackle a script or Rory McIlroy a golf course. He was given new information bit by bit — lab, imaging and biopsy results. Over the course of the session, he drew on an encyclopedic familiarity with thousands of syndromes. He deftly dismissed red herrings while picking up on clues that others might ignore, gradually homing in on the accurate diagnosis.

Just how special is Dr. Dhaliwal's talent? More to the point, what can he do that a computer cannot? Will a computer ever successfully stand in for a skill that is based not simply on a vast fund of knowledge but also on more intangible factors like intuition?

The history of computer-assisted diagnostics is long and rich. In the 1970s, researchers at the University of Pittsburgh developed software to diagnose complex problems in general internal medicine; the project eventually resulted in a commercial program called Quick Medical Reference. Since the 1980s, Massachusetts General Hospital has been developing and refining DXplain, a program that provides a ranked list of clinical diagnoses from a set of symptoms and laboratory data.

And I.B.M., on the heels of its triumph last year with Watson, the Jeopardy-playing computer, is working on Watson for Healthcare.

In some ways, Dr. Dhaliwal's diagnostic method is similar to that of another I.B.M. project: the Deep Blue chess program, which in 1996 trounced Garry Kasparov, the world's best player at the time, to claim an unambiguous victory in the computer's relentless march into the human domain.

Although lacking consciousness and a human's intuition, Deep Blue had millions of moves memorized and could analyze as many each second. Dr. Dhaliwal does the diagnostic equivalent, though at human speed.

Since medical school, he has been an insatiable reader of case reports in medical journals, and case conferences from other hospitals. At work he occasionally uses a diagnostic checklist program called Isabel, just to make certain he hasn't forgotten something. But the program has yet to offer a diagnosis that Dr. Dhaliwal missed.

Dr. Dhaliwal regularly receives cases from physicians who are stumped by a set of symptoms. At medical conferences, he is presented with one vexingly difficult case and is given 45 minutes to solve it. It is a medical high-wire act; doctors in the audience squirm as the set of facts gets more obscure and all the diagnoses they were considering are ruled out. After absorbing and processing scores of details, Dr. Dhaliwal must commit to a diagnosis. More often than not, he is right.

When working on a difficult case in front of an audience, Dr. Dhaliwal puts his entire thought process on display, with the goal of "elevating the stature of thinking," he said. He believes this is becoming more important because physicians are being assessed on whether they gave the right medicine to a patient, or remembered to order a certain test.

Without such emphasis, physicians and training programs might forget the importance of having smart, thoughtful doctors. "Because in medicine," Dr. Dhaliwal said, "thinking is our most important procedure." [...]

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