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## **Another Medical Revolution Is Under 'Way'**

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5/5/2023

*The Wall Street Journal* recently featured a glimpse of major advancements in medicine and the promise of a veritable revolution in healthcare. It will be driven by Artificial Intelligence (AI) as a vital tool to process patient data to create diagnostic and treatment protocols, greatly enhancing early detection.

The current boom in innovation was made possible by the discovery of "disease mechanisms at the genetic, molecular, and cellular levels." For example, what would have been considered impossible, is today's increasingly common use of cell therapy: placing a live cell in a human person and directing it to go to a specific location in the body. Hundreds of companies are developing new cell-therapy applications.

What is coming in sight is the technology to expel tiny cancers from the body, a technique that will become a routine as common as brushing one's teeth; genome sequencing will help eradicate birth defects and play a key role in growing new organs from the patient's own cells; and science will come ever closer to developing dramatic means to slow down the aging process.

"New computational tools" are making progress "in every corner of medicine." Doctors can precisely target tumors with the right drugs "in the right amount, at the right time, with fewer side effects, thanks to the sequencing of actual tumors." Plus, thanks to AI, machine learning and "massive computational powers," drugs can be designed "from scratch inside a laboratory computer." In the words of a pharmaceutical executive, "the next great drugs will be prediction and prevention."

Underlying this progress and innovation is "the astounding advance of our ability to produce, manipulate, store, retrieve and transmit data." This data is produced, often very rapidly, by international teams of researchers working, each in his or her own specialized field, in tandem on specific issues. Gone is the lone researcher. The development of COVID-19 vaccines is an example of what group researchers can do.

A particularly noteworthy development is the use of AI-driven facial recognition in diagnosing various serious conditions. Certain facial characteristics can indicate whether a patient had or is having a stroke, which is characterized by the paralysis of certain facial muscles. Researchers at Johns Hopkins University are working on a computer algorithm to recognize changes in a patient's features. Rapid diagnosis of a stroke can be lifesaving, doing away with time-consuming scans and blood tests. As one researcher put it, "the face is probably the most sophisticated signaling system in the universe. "

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Researchers at MIT are working on developing facial recognition to diagnose the presence and advance of ALS. A start-up is developing facial recognition technology to identify certain rare genetic conditions in children, with as many as 1,500 conditions or syndromes associated with facial features. A brave new world might see facial recognition technology embedded in the camera of smartphones or the bathroom mirror. This would allow people to monitor and detect dementia and other neurological conditions themselves. Some researchers are convinced that facial recognition will eventually be able to detect how well a particular medicine is working.

AI algorithms may also help produce heart monitors that film the face to predict a patient's heart failure. This development is not without controversy. Facial recognition technology is used by police to identify criminal suspects. However, civil rights activists have charged that the technology is less accurate in people with darker skin.

Facial recognition applications will feature prominently in the future of medicine, even though today, the use of AI makes it a tool rather than a cure. Says one doctor, "early diagnosis is tough, but there is strong evidence that it is going to work eventually."

The use of new technologies in healthcare must be considered against the backdrop of significant disparities in the care of the poor and well-off. People in the West live on average, decades longer than people in Africa, South Asia, and Latin America. In New York City, a subway ride from Midtown Manhattan to the South Bronx is associated with a drop of ten years in life expectancy. Surely, innovation must also serve the poor, at home and abroad.

That is precisely the mission of SOMOS Community Care, a network of 2,500 doctors, most of them primary care physicians. They serve the medical, behavioral, and social needs of some one million of the poorest inner-city Medicaid recipients. These doctors are compensated according to the Value-Based Payment formula, which stipulates that physicians are remunerated according to the longer-term health outcomes of their patients. The healthier the patients, the greater the compensation of the doctors.

SOMOS doctors are committed to giving their patients optimal care, with a strong doctor-patient relationship at the core of the process. A key SOMOS innovation is the transformation of doctors' practices into a Patient-Centered Medical Home, making the practice a portal by which patients' overall care is tracked and evaluated.

When new techniques such as facial recognition to detect conditions come into common use, SOMOS will make sure—and lobby the New York State Department of Health accordingly—that its patients have access to the technology, be it at doctors' offices, clinics, or local hospitals.

Early detection and diagnosis can save many lives as well as benefit taxpayers—but the poor should not be left in the cold.



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