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Dear Colleagues:

Happy New Year and welcome to a new decade. I thought this would be a good moment to address technological innovation in healthcare considering that it's a topic we tend to perceive as hovering on the horizon rather than knocking on our door.

Well, it's 2020, and the future has arrived. Artificial-intelligence-powered health products are already serving us via wearable sensors and phone apps. AI technologies have the potential to transform and augment not just aspects of patient care but also administrative processes within the healthcare sector.

One of the most promising AI applications in medicine is recognizing patterns and interpreting images in CT scans, X-rays, MRIs, and other patient data and doing so faster and more accurately than clinicians are able. The U.S. Food and Drug Administration has approved more than 40 AI products in the past five years.

Despite AI's many potential benefits, however, other factors need to be evaluated when it comes to its application, including potential breaches of privacy and security and the threat of cyber-terrorism. In addition, healthcare data is very attractive to major corporations, and the "fail fast" mentality driving tech innovation can seem at odds with patient protection and our responsibilities as clinicians.

For these reasons, I want to discuss this month both the positive and the negative aspects of the new tech frontier in healthcare and the critical need to balance the risks and benefits to improve health outcomes for all. I will also provide an update on New York State's monitoring of the Wuhan coronavirus.

Health Systems and Cybersecurity. As the use of technology grows, the onus is going to be on healthcare providers and software vendors amassing patient data to carefully consider the ethical issues before sharing or selling this data to AI companies. In addition, a disciplined cybersecurity practice to safeguard patient privacy and safety becomes a necessity for healthcare organizations as we begin to adopt technology-enabled healthcare delivery.

2020 began with the United States' escalating tensions with Iran, which has a history of cyber-offensives against government, financial, and energy sectors. On January 8, the Health Information Sharing and Analysis Center issued an urgent warning on potential cyber-threats to American healthcare institutions. Cyber-attacks are insidious—very sudden, providing little or no warning—and an overwhelming majority of them exploit common vulnerabilities within the healthcare sector. Breaches can have major implications beyond financial losses. They can result in limiting access to care, especially in remote areas, and can impact patient safety.

As we say in regard to health, an ounce of prevention is worth a pound of cure, and that applies to cyber-health as well. The more your workforce knows about cybersecurity, the greater your organization's vigilance against cyber-attacks. In December 2018, a U.S. Department of Health & Human Services task group released cybersecurity guidelines that can be used across

the healthcare field. We all need to protect patient data because this is what ensures quality healthcare—clinicians and caregivers must be able to trust their institution's data and systems. Every member of a healthcare organization must remember that cyber-safety is patient safety.

Enhancing Diagnoses and Treatments. AI-guided technology is already performing groundbreaking tasks in testing environments—detecting Alzheimer's disease from the sound of a person's voice, helping ophthalmologists detect clinical changes in people with diabetes, monitoring conditions like multiple sclerosis and Parkinson's disease, and interpreting MRIs, CT, photographs of the retina, or a wrist fracture that would be hard for a human to see.

But the greatest impact potential in AI right now is more accurate diagnoses of America's two deadliest forms of cancer—lung cancer and breast cancer. This month, the American Cancer Society announced that from 2016 to 2017, the United States saw its largest-ever single-year drop in overall cancer deaths, a 2.2% reduction fueled by a steep decline in lung cancer deaths. That is great news, but technology has the potential to make that number drop even further.

In a study published last year in the journal *Nature Medicine*, researchers applied AI to CT scans used to screen people for lung cancer. The system being tested proved 94% accurate in assessing 6,716 cases with known diagnoses. When no prior scan was available, the AI system was more effective than six expert radiologists, producing fewer false positives and false negatives. When an earlier scan was available, the AI system and the doctors were tied.

In a report published on the first day of this year in the journal *Nature*, AI developed by Google performed better than radiologists at finding breast cancer on mammograms where the diagnosis was already known. On mammogram scans from the United States, the system produced a 9.4% reduction in false negatives and a 5.7% reduction in false positives. Mammograms miss about 20% of breast cancers according to the American Cancer Society.

We must remember that AI is not a threat to radiologists and other physicians but a resource that can perform many mundane medical chores (such as taking notes and reading scans), freeing doctors to spend more time connecting with patients. By augmenting human performance, AI can make the lives of radiologists easier; by giving overworked clinicians more time and patients greater involvement in their care and treatments choices, it can improve healthcare overall.

Tech Innovation in New York State. I wanted to mention what the Department has been doing to leverage technology for better health. Telehealth—the use of electronic information and communication technologies to deliver health services at a distance—effectively increases access to care, particularly in rural and medically underserved areas, and supports coordinated, patient-centered care. In 2018, New York State Public Health Law Article 29-G and Social Services Law Section 367-u were amended to expand Medicaid coverage of telehealth services to include additional originating (location of the patient) and distant (location of the eligible healthcare provider) sites, telehealth applications, and practitioner types. Notably, this expansion allows Medicaid members to receive services (including behavioral healthcare) via telehealth when located in their home or other temporary location in or outside of the State. Telehealth not only provides better quality care for New Yorkers; it also establishes technology-enabled healthcare delivery as a basis for future innovations such as those in AI. More information on this Medicaid expansion is available here.

It's All in the Balance. A good analogy for looking at the pros and cons of AI in healthcare is Wikipedia. In the beginning, people feared that this new concept would provide false information and become manipulated by bad actors. But so far at least, the platform has managed to instill widespread public trust for its accuracy because of volume and conscientiousness among citizen monitors. Similarly, AI will keep improving as more and more data is fed into shared and closely monitored systems.

The first randomized trial of an AI system—which found that colonoscopy with computer-aided diagnosis found more small polyps than standard colonoscopy—was published online last October. Of course, all of these systems need to be rigorously studied, with the results published in peer-reviewed journals, and tested in real-world settings before entering public use. Still, we are looking at a new era in patient care.

Update on 2019 novel coronavirus. Local, State, and federal public health officials are all closely following developments with the emergence of a novel coronavirus with apparent ties to an animal and seafood market in Wuhan, China. While we are learning new information about this new virus with each passing day, it is now clear that person-to-person transmission is likely. The Centers for Disease Control and Prevention has recently implemented airport entry screening to identify infected individuals and is working to develop a real-time PCR assay for the virus that can be used by State public health labs. Please know that we will continue to issue updated Health Advisories as we learn new information and have recommendations that impact you and your patients. https://www.health.ny.gov/diseases/communicable/coronavirus/

One Final Note: I wanted to mention that Facebook's decision to remove deceptive ads that questioned the safety of the HIV-prevention drug Truvada is a huge win for all New Yorkers. Governor Cuomo raised these concerns in December, and Facebook finally recognized the danger these misleading ads posed to public health and took action to remove them.

As always, I am grateful for the unfailing integrity and commitment to patient care I see in clinicians across New York State. I know that New York's healthcare professionals will embrace and even improve technological innovations that are safe and provide better options and better outlooks because you really care about your patients. Thank you again—and all the best throughout 2020!

Sincerely,

Howard

Howard A. Zucker, M.D., J.D.