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LEADERSHIP

One Doctor's Positive Experience With AI

Artificial intelligence in his medical specialty has been "remarkably nonintrusive," says WSJ Health Expert Howard Forman.
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By

Howard Forman
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Howard Forman (@thehowie) is a professor of radiology, economics, public health and management at Yale University.

Almost 3-½ years ago, I wrote in this space about the excitement, risks and opportunities surrounding the rapidly approaching introduction of artificial intelligence and machine learning into radiology practice. While many are quick to argue that AI will replace radiologists, I believe that radiologists will continue to play a crucial role in screening for cancer and pre-cancer, diagnosing acute and chronic illness, and monitoring patients with known disease before, during and after treatment.

The business of AI in radiology has exploded since I last wrote. Dozens of companies are now marketing products, and hundreds of entrepreneurs are developing new applications.
Some companies seek to provide secondary screening of imaging studies to reduce false negative rates, while other groups work to automate the tedious measurements often required in the

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evaluation of cancer patients. While some startups aim to cut the radiologist out of the system, the vast majority aim to assist the radiologist, making the job more efficient and ultimately delivering care to patients with higher speed and confidence.

Approximately 18 months ago, my workplace (Yale-New Haven Hospital) began a pilot partnership with a small radiology AI startup that was pursuing applications in my subspecialty, emergency and trauma radiology. Their first applications sought to detect neck fractures and bleeds in the brain. These findings can be obvious or remarkably difficult to diagnose, and even the most subtle can have significant consequences for patient care and outcomes. As the startup has continued to grow functionality, they have now added a system to detect blood clots in the lung.

During the adoption phase of this AI, I was concerned that radiologists would be slowed, our workflow would be disrupted, or worse, patient care would be impaired. This has not been the case. Rather, the technology has been remarkably nonintrusive. The most evident use of AI in our department is in triaging cases. AI allows us to read urgent cases earlier than we might otherwise, and allows for earlier management of patients requiring critical intervention. Not surprisingly, the technology has also picked up findings that could have been missed even by our specialty radiologists.

Overall, AI has not yet resulted in faster interpretations, but neither has it slowed us down. Promisingly, it seems to be improving quality without cost to workflow. As new capabilities are added, such as the ability to look for subtle skull or rib fractures, these assistive technologies will likely enhance productivity, allowing radiologists to spend less time on labor-intensive and nonintellectually challenging assessments.

In the foreseeable future, these applications will flag potential false positive results, relying on the radiologist to assess further. We can expect continuously learning systems to reduce the number of these "overcalls," where normal findings are identified as abnormal. They can also be expected to compare old studies to new ones and quickly highlight changes, whether in trauma or cancer care. Eventually, these systems have the potential to help us understand much more about "normal variation" in health care (why certain less-common imaging patterns are seen in healthy patients), and perhaps even help predict future health risks.

As growing numbers of companies and researchers present pilot data at national conferences and in publications, the full promise of the technology becomes clear. AI is not about productivity, but rather improving care delivery by increasing the time specialized radiologists have available for activities that necessitate 10 years of advanced training. Simultaneously, AI can gather and synthesize considerably more information than previously possible in assessing a patient's well-being. The field is buzzing with interest, and entire new journals are launching, because this research is no longer only about imaging findings of disease, but novel ways to use these findings to advance our health-care system, our health, and our quality of life.

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Radiologists are consultants with trained eyes that discern the abnormal from normal. However, our real value comes from integrating a multitude of findings into a cohesive diagnosis. We do not merely use imaging, but incorporate a wealth of accessible clinical and laboratory information. AI will enable us to use the best of our skill set to advance health. I remain convinced that the greatest benefit of AI will not be to the radiologists, the hospitals that install these systems, nor the entrepreneurs who commercialize them. The greatest beneficiary will be patients, who will receive better, higher quality and more accessible care.

You can email Dr. Forman at reports@wsj.com.

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