

The Convergence of AI and Medicine: A Physician's View

A recently published article in [Nature Medicine authored by Eric Topol, M.D., Department of Molecular Medicine, Scripps Research Institute](#), suggests that the convergence of human and artificial intelligence can lead to “high-performance medicine.” High performance medicine he says, will be data driven. The development of software that can process massive amounts of information quickly and accurately, as well as less expensively, will lay the foundation for this hybrid practice of medicine. It will not be devoid of human interaction and input he says, but more reliant on technology and less reliant on human resources. It will combine computer developed algorithms with physician and patient input. Topol believes that, in the long run, this will elevate the practice of medicine and patient health.

- Topol sees impacts of AI at three levels of medicine—
- Clinicians—by enabling more rapid and more accurate image interpretation (e.g., CT scans);
- Health systems—by improving workflows and possibly reducing medical errors, and
- Patients—by enabling them to process more data to promote better health.

While the author sees roadblocks to the integration of AI and human intelligence in medicine such as data security, privacy and bias, he believes the improvements will be actualized over time. Topol discusses a number of disciplines in which the application of AI has already had a positive effect: radiology, pathology, dermatology, ophthalmology, gastroenterology and mental health. Further, Topol discusses FDA's new pathways for approval of AI medical algorithms and the fact that there were thirteen approvals of AI devices and software by FDA in 2018 as opposed to only two in 2017.

Topol correctly maintains that rigorous review, whether agency review (such as FDA), or private review (industry), is necessary for the safe development of new technology generated from the combination of human and artificial intelligence. This includes peer-reviewed publications on FDA approved devices and software, something to date he argues has been lacking. The author does a nice job of laying out the base of evidence for the use of AI in medicine and describing the potential pitfalls of proceeding without caution and oversight, as is true with other applications of AI. The article is a worthy read for those involved in the field of medicine including those engaged in the development of medical devices and related software.