Editorial

Are you ready to be diagnosed without a human doctor? A discussion about artificial intelligence, technology, and humanism in dermatology

On January 27, 2019, the Women’s Dermatologic Society facilitated a panel discussion at the 15th Annual Maui Derm Conference entitled “Artificial Intelligence, Technology, and Humanism in Dermatology.” Past president Dr. Lenore Katz, current president Dr. Pearl Grimes, and resident representative Dr. Allison Truong moderated the event with panelists Dr. Daniel Siegel (clinical professor of dermatology from SUNY Downstate), Dr. Hensin Tsao (professor of dermatology from Massachusetts General Hospital), and Dr. Sandy Tsao (assistant professor of dermatology at Massachusetts General Hospital). The event was made possible with the support of Dr. George Martin, the founder and program chairman of Maui Derm. A lively discussion ensued with insightful dialogue on the current and future applications of artificial intelligence (AI) within the field of dermatology and medicine, the role and responsibility of physicians in driving these advances within medicine, and strategies to preserve the patient-doctor relationship within a technology-focused world. (See Fig. 1).

The evening began when the panelists were invited to provide their opinion on the impact of AI on patient care. Dr. H. Tsao began the discussion by describing the three phases of the practice of medicine: descriptive (data collection), diagnostic (data analysis), and decision making (data integration into treatment plan). The panelists agreed that current and future AI technologies have made and will continue to make great strides within the practice of medicine. Particularly the data-driven, pattern-recognition, evidenced-based facets of medicine. As these technologies continue to evolve, physicians may soon have instantaneous access to infinite knowledge and databases, which will change the practice of medicine and potentially reduce medical errors.

A similar parallel can be made with autopilot technology within the airline industry. However, Dr. H. Tsao pointed to two critical elements of being a doctor: the practice of medicine and the art of medicine. The latter, he pointed out, is difficult to replace. The art of medicine requires a human touch, a listening ear, and, most vitally, compassion to reduce patient suffering, making it less likely that doctors will be replaced by robots anytime soon.

When discussing whether AI can replace the trained eyes of a dermatologist, the panelists agreed that many aspects of dermatology could be enhanced with AI. For example, individual differences in the perception of a rash or neoplasm can be standardized with AI technology, and considerations of extensive differential diagnoses of dermatitides can be optimized with AI platforms that provide individual diagnoses and associated probabilities. The development of these tools will enhance the way dermatologists deliver care, perhaps allowing more diagnostic accuracy and precision. Furthermore, this is not merely a concept, but has already been implemented in practice. For example, several studies have cited how convolutional neural networks have shown the ability to match the performance of board-certified dermatologists in ability to detect malignant neoplasms.

An area where AI may struggle in the initial implementation phases is in distinguishing subtle differences in darker-skinned patients given the limited quality or availability of these images. Dr. S. Tsao provided an example of a darker-skinned patient she saw who was diagnosed with hyperpigmentation but ultimately had tinea versicolor. With the widespread use of Internet communication tools, mobile devices, and social media permitting crowdsourcing of images, thus feeding larger data sets, these neural networks will continue to improve, empowering the development of better AI platforms.

Although physicians may not be easily replaced, they may be consulted less often as AI technology becomes more sophisticated. Numerous AI platforms are being made readily available to consumers on cellphone applications or online websites for the diagnosis of skin conditions. Some of these consumer applications are a blend of AI with physician oversight. Notably, AI technology was able to show efficacy and accuracy in making diagnoses concordant with those of the physicians. The reliance on human oversight reflects the current lack of 100% certainty in computer algorithms in the realm of health care delivery among the public. Again, parallels can be made with the airplane industry, where autopilot features are available on every aircraft, with some planes even able to land without pilot assistance under certain conditions; ultimately, though, airline pilots are responsible for landing their planes safely. Still, the question remains as to who carries the burden of liability within these alternative health care models.

AI can enhance many aspects of the practice of medicine, but there is a fear that technology may silence the art of medicine, and the patient-doctor relationship may be lost. The panel felt that robots are not human enough yet to replace the humanistic aspects of medicine. Dr. H. Tsao reminded us that 3000 years ago, doctors reduced suffering without curing anything. Ideally, AI technology may improve the day-to-day practice of medicine by collecting and analyzing patient data and demographics, making it easier for physicians to spend more time on decision-making and patient discussions. This would improve the human interaction and perhaps reduce physician burnout. Yet, the final decision on how much time physicians have with patients and what medications
can be used to treat certain conditions may eventually fall into the hands of legislators and payors. There is also a palpable privacy threat in reliance on any single system or technology because these systems can be easily manipulated to the detriment of patients. These examples are seen throughout social media today as more and more devices are linked into a single system.

Throughout the discussion, parallels were drawn between AI and medicine and autopilot and airline industry. Automated flight controls date back to the 1920s with the idea that automation would relieve pilots of routine flying and monitoring tasks, allowing them to focus on situational awareness and monitoring duties. As technology improved, so did the sophistication of autopilot features so that the modern aircraft is fully capable of an automated landing with very low visibility with or without a pilot. Today, flying is safer than ever, but are we ready to fly without a human pilot? Similarly, are we ready to be diagnosed without a human doctor? Ultimately, pilots are responsible for landing planes safely. Analogously, physicians are responsible for diagnosing and treating patients. Whether or not AI will enhance the practice of medicine, the art of medicine is and will remain irreplaceable. Given recent headline news on fatal airline crashes due to the possible malfunctioning of automated safety systems within aircrafts, machines should be recognized as only as good as the humans who built them—analagously, AI is only as good as the programmer.

The panel discussion, as led by Drs. Kakita, Grimes, and Truong, allowed for an animated discussion about the current and future roles of technology within the world of dermatology and medicine. The evening radiated a spirit of optimism with regard to the future of medicine, and strategies were provided on how to continue to proactively leverage AI for the benefit of our patients and ourselves.

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