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Shaping AI for dermatology

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New technologies and techniques are changing melanoma diagnosis and treatment. Noninvasive biopsies, augmented intelligence (AI), novel detection strategies, and other technologies that sound like clinical dreams are already changing practice. This technological shift is as important as the paradigm shifts that followed the introduction of Mohs surgery and immunohistochemical staining in dermatology and skin cancer.

"Melanoma is the most deadly cancer in the sense that more life years are lost to it than to any other cancer," said Eric Tkaczyk, MD, PhD, assistant professor of dermatology and of biomedical engineering at Vanderbilt University and director of the Vanderbilt Cutaneous Imaging Clinic. "Anyone can get it at any age. It is the flag that the entire community of dermatology gathers around because early diagnosis saves so many lives."
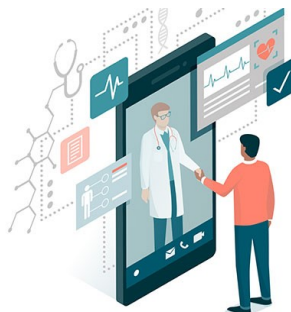
Dr. Tkaczyk is among the presenters at Friday's "Melanoma: The Future Is Now." On Saturday, the session, "Predicting the Future: AI, Machine Learning, and Dermatology" adds more perspective.

Current data suggests AI is equal or better at diagnosing melanoma than most dermatologists. In 2018, the third Grand Challenge, sponsored by the International Skin Imaging Collaboration unveiled algorithms that can diagnose melanoma and six other types of skin cancers using skin images more accurately than 97% of expert dermatologist readers.

But don't worry. More patients will be driven to see dermatologists

"The reality is that the more computers can diagnose, the more people will be driven to see dermatologists, not fewer. The role of the dermatologist may change, but rather than being usurped, our role will be augmented," said Allan C. Halpern, MD, chief of dermatology at Memorial Sloan Kettering Cancer Center. He is president of the ISIC.

Dermatologists who worry they may be replaced by apps should agonize less about the perceived threat and consider the opportunities that AI presents.

"We should embrace AI and help shape the changing environment, mold it in ways that benefit our patients and improve treatment," said Roger S. Ho, MD, MS, MPH, assistant professor of dermatology at the Ronald O. Perelman Department of Dermatology at New York University School of Medicine.

One of the ways to shape AI is to help train dermatology algorithms so they can diagnose more

accurately in more skin types. The problem is limited data sets.

What can the data tell dermatologists?

"You use a data set to teach the algorithm what is right and what is wrong, what is melanoma and what is not melanoma. If the data set is biased, say the majority of tumors are in light skin, the algorithm may miss potentially life-threatening tumors when presented with darker skin types," said Adewole Adamson, MD, MPP, assistant professor of dermatology at Dell Medical School at the University of Texas at Austin.

AI engineers may not know enough about dermatology to recognize or remedy the problem. That's where dermatologists help, says Clara Curiel-Lewandrowski, MD, professor of medicine and dermatology at the University of Arizona, director of the University Cutaneous Oncology Program, clinical director of the Skin Cancer Institute, and Alan and Janice Levin endowed chair in Cancer Research.

Responsibility lies with dermatologists

"As dermatologists we have the responsibility to lead the development and adoption of AI-based technologies into our field. It is up to us to transform the implementation of AI into an opportunity, not a threat, and to ultimately augment our clinical practice," Dr. Curiel-Lewandrowski said.

New imaging technologies: New technologies and techniques are changing melanoma diagnosis and treatment.

Confocal microscopy: Reflectance confocal microscopy uses laser illumination to visualize cellular details of the superficial dermis and epidermis in real time.

Photoacoustics: A combination of sound and light frequencies.

Raman spectroscopy: Lesion identification based on its molecular makeup.

Molecular assays: Determining which genes are upregulated to predict tumor behavior via DecisionDx-Melanoma assays mRNA within a tumor.

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