



## Perspectives

# Artificial intelligence in melanoma diagnosis: ethical considerations and clinical implementation

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### ABSTRACT

The use of artificial intelligence (AI) in dermatology, particularly for the diagnosis of melanoma, has demonstrated potential in improving early detection of cancer. Current AI-based systems, such as DermaSensor and Nevisense, have shown high sensitivity. In addition, open-source models like All Data Are Ext (ADAE) continue to show promise. Ethical, practical, and privacy concerns remain despite these advancements. Key challenges with these models include maintaining transparency with patients, ensuring privacy of patient data, and addressing discrepancies between AI and clinical determinations. Additional research, regulatory guidance, and open conversations are necessary to realize AI's full potential in the field of dermatology while preserving patient trust.

**KEYWORDS** Artificial intelligence; clinical implementation; dermatology; ethics; melanoma

The use of artificial intelligence (AI) in dermatology, notably for melanoma diagnosis, has yielded promising results in recent years; however, this brings both benefits and challenges.<sup>1</sup> AI-based melanoma detection systems have shown remarkable accuracy and can quickly evaluate dermoscopic pictures, potentially increasing early detection rates and excessive biopsies.<sup>1,2</sup> Several AI melanoma detection methods are currently being clinically evaluated and approved. DermaSensor, the most recent device approved by the US Food and Drug Administration (FDA), uses AI-powered spectroscopy and achieved 96% sensitivity across all skin cancer types in clinical trials.<sup>3</sup> Nevisense, FDA approved since 2017, uses electrical impedance spectroscopy and has reported 96% sensitivity and 34% specificity.<sup>4</sup> All Data Are Ext is an open-source AI system that is still in the research stage, but it has demonstrated encouraging results in prospective tests, beating dermatologists in terms of

balancing accuracy and sensitivity for melanoma detection.<sup>5</sup> MelaFind, one of the first AI devices for detecting melanoma, was FDA approved in 2011 but was later stopped due to insufficient specificity.<sup>6</sup>

Additionally, AI could address the dermatological shortage in low-income or understaffed areas by increasing efficiency in clinical workspaces.<sup>2</sup> However, ethical and practical issues need to be addressed before using AI to diagnose melanoma.<sup>7</sup> First, patients should be appropriately informed about the use of AI in their care, including the role and limitations of the system, its efficacy, and how its assessment fits into the larger diagnostic decision-making process.<sup>7</sup> It is important to be transparent to preserve patient trust and obtain informed consent.<sup>7</sup>

Another key aspect is patient image management and privacy when uploading photographs to AI systems.<sup>8</sup> Health care providers must employ strong data protection

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procedures to protect patient information and comply with laws such as the Health Insurance Portability and Accountability Act.<sup>8</sup> Clear procedures should be in place governing image retention, use for research or model enhancement, and patient rights to view and remove data.<sup>8</sup> Encryption, safe storage, and deidentification of data are critical for protecting patient privacy and preventing illegal use of sensitive medical photographs.<sup>8</sup>

Additionally, with AI-based diagnostic technologies, health care professionals must guarantee Health Insurance Portability and Accountability Act compliance and get patients' informed consent before using ambient listening devices.<sup>9</sup> Transparency on the goal, scope, and data handling procedures of these technologies is critical, and disclosures should be made accordingly.<sup>9</sup> Providers should explain how ambient listening can improve care quality and reduce clinician burnout, while ensuring patients' privacy, and patients should be made aware of clear policies regarding data keeping, access, and use.<sup>9</sup>

Explaining the AI diagnostic process to patients necessitates a balance between delivering adequate information and avoiding excessive technical jargon.<sup>1</sup> Clinicians should be prepared to discuss how AI analyzes images, its function in assisting with diagnosis, and the significance of human oversight in the final decision-making process.<sup>1,7</sup> This highlights that AI complements, but does not replace, clinical judgment.<sup>1,7</sup>

When the clinician's opinion differs from the AI's interpretation of a melanoma image, a substantial challenge develops.<sup>7,10</sup> In such circumstances, the dermatologist must carefully examine both perspectives to determine the basis of the dispute.<sup>7,10</sup> This includes reexamining the lesion, requesting a second opinion from a colleague, or evaluating additional clinical information not available to AI.<sup>7,10</sup> In general, being open with patients about diagnostic ambiguities helps encourage trust and collaborative decision making.<sup>8</sup>

When a discrepancy arises, it is critical to record both the AI's assessment and the clinician's explanation in the patient's medical record. This information should be provided in any correspondence with pathologists if a biopsy is performed. Providing a holistic clinical picture that includes both AI and human assessments enables pathologists to analyze all relevant data, potentially leading to more precise diagnoses.<sup>7</sup>

The use of AI in melanoma detection raises problems about accountability and duty.<sup>2,7</sup> Clear standards are required to define the duties of AI developers, health care

institutions, and individual physicians in times of error.<sup>7</sup> Furthermore, constant evaluation and validation of AI systems in broad patient groups is required to ensure their effectiveness across different skin types and reduce any biases.<sup>7,10</sup> As AI evolves, continued research, regulatory guidance, and open communication among health care professionals, patients, and technology developers will be required to realize its full promise while upholding the highest standards of patient care and ethical practice in dermatology.

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