

Patients' and dermatologists' preferences in artificial intelligence-driven skin cancer diagnostics: a prospective multicentric survey study

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controls. Most class II devices only require Premarket Notification 510(k), which indicates a device has been deemed “substantially equivalent” to, or is as effective and safe as a predecessor device already legally in commercial distribution.⁵ Thus, although a manufacturer may market an iontophoresis device as FDA approved, classification as a class II device indicates it did not need to be clinically tested.

The FDA registration statuses of the identified iontophoresis machines were verified with the Medical Devices Database from the accessdata.fda.gov website. Of the 12 machines identified from this study, 10 were listed as having a “substantially equivalent” predecessor device. The FDA updates its database weekly, so devices not listed in its database (eg, IontoDri and Idomed 5PS) have not been cleared. Thus, providers should guide patients in selecting and using a cleared device. The IHS and Binder Medical websites are additional resources, with the IHS providing some guidance regarding insurance coverage (<https://www.sweathelp.org/insurance-tools/hyperhidrosis-coverage-policies.html>). Finally, more research on iontophoresis is needed so that further clinical guidance can be provided.

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Conflicts of interest

None disclosed.

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Patients’ and dermatologists’ preferences in artificial intelligence–driven skin cancer diagnostics: A prospective multicentric survey study



To the Editor: Artificial intelligence (AI) has shown promise for improving diagnostics of skin cancer by matching or surpassing experienced clinicians.¹ However, the successful clinical application depends on acceptance by patients and dermatologists.

In this prospective multicentric survey study with a response rate of 63%, we therefore investigate the criteria required for patients and dermatologists to accept AI-systems and assess their importance on patients’ and dermatologists’ decision-making when considering the use of such systems. To this end, we perform an adaptive choice-based conjoint analysis and analyze it using hierarchical Bayes estimation.² By employing an adaptive choice-based conjoint analysis, we investigate multiple influencing AI-features simultaneously (see [Table 1](#)) whilst accounting for possible trade-offs (see [Fig 1](#)). For details on questionnaire development, participant recruitment, and statistical analysis, see Supplementary Methods, available via Mendeley at <https://data.mendeley.com/datasets/2chcwnhpwj/1>.

The data of 293 respondents (178 patients and 115 dermatologists) showed a positive general attitude toward AI-systems (see Supplementary Results, available via Mendeley at <https://data.mendeley.com/datasets/2chcwnhpwj/1> for participant characteristics). However, AI-systems were considered unacceptable by 42% of patients (95% confidence interval [CI]: 34%–49%) and 48% of dermatologists (95% CI: 38%–57%) if neither the dermatologist nor the patient could trace (ie, understand and follow) the assessment, and AI-systems were systematically ruled out by 37% of patients (95% CI: 29%–44%) and

Table I. Overview of the artificial intelligence features and corresponding options within the adaptive choice-based conjoint design

AI-feature	Options
Integration How should the AI assessment be integrated into routine diagnostics?	<ul style="list-style-type: none"> • The physician first decides independently and then always obtains a second opinion from the AI. • The physician first decides independently and obtains a second opinion from the AI only in case of doubt. • The AI assessment is always obtained first, and the physician makes his or her decision based on it.
Explainability To what extent should the AI be able to explain its assessment?	<ul style="list-style-type: none"> • AI shows the criteria (eg, color, color distribution) and image regions used to make the assessment. • AI cannot display the image regions, but it displays which criteria (eg, color, color distribution) were used to make the assessment. • AI cannot display any criteria, but it shows which image regions were used to make the assessment. • AI does not have to explain its assessment on a case-by-case basis. However, it could be shown during the clinical trial that the AI pays attention to biologically relevant structures. • AI does not have to explain its assessment on a case-by-case basis. It could not be shown during the clinical trial that the AI pays attention to biologically relevant structures.
Traceability Who should be able to trace the AI assessment?	<ul style="list-style-type: none"> • The physician and the patient are able to trace (ie, understand and follow) the AI assessment. • The physician is able to trace (ie, understand and follow) the AI assessment. • Neither the physician nor the patient is able to trace (ie, understand and follow) the AI assessment.
Diagnostic accuracy Beyond what level of diagnostic accuracy should AI be used? Decision task (only asked for dermatologists) What should the AI be able to distinguish?	<ul style="list-style-type: none"> • AI performs worse than the average dermatologist. • AI performs equally well as the average dermatologist. • AI performs better than the average dermatologist. • AI distinguishes between benign and malignant skin lesions but gives no indication of a precise diagnosis. • AI makes recommendations for or against biopsy but gives no indication of a precise diagnosis. • AI distinguishes between melanomas and nevi. • AI distinguishes among melanomas, nevi and 1 category for other skin lesions. • AI distinguishes between melanomas and nonmelanomas. • AI distinguishes among melanomas, 1 category for other types of skin cancer and 1 for benign skin lesions.
Input data (only asked for patients) What data should the AI use for its assessment?	<ul style="list-style-type: none"> • AI makes a diagnosis based on skin images exclusively. • AI makes a diagnosis based on skin images and additional information about the skin lesion (eg, diameter). • AI makes a diagnosis based on skin images and additional information about the patient (eg, age). • AI makes a diagnosis based on skin images, additional information on the patient and the skin lesion.

Five artificial intelligence features and corresponding options were included in the adaptive choice-based conjoint analysis based on insights from a literature review and semistructured interviews. The decision task feature was included only for the subgroup of dermatologists, and the input data feature was included only for the subgroup of patients.
AI, Artificial intelligence.

36% of dermatologists (95% CI: 27%-45%) if they did not provide explanations on a case-by-case basis. Diagnostic accuracy and explainability were the most important AI-features in decision-making with an average importance of 21% (95% CI: 19%-22%) and 27% (95% CI: 26%-27%) for patients, and 33%

(31%-35%) and 20% (19%-21%) for dermatologists, respectively.

Participants preferred an increased explainability with display of both decision criteria and relevant image regions. Patients prioritized an AI assessment that is traceable for patients and clinicians, and

Which of these two quality-tested assistance systems would you **rather** use as part of your skin cancer screening?

We have grayed out all options that are identical so you can focus on the **differences**.

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To what extent should the AI be able to explain its assessment?	AI shows the criteria (e.g., color, color distribution) and image regions used to make the assessment.	AI shows the criteria (e.g., color, color distribution) and image regions used to make the assessment.
Beyond what level of diagnostic accuracy should AI be used?	AI performs better than the average dermatologist.	AI performs better than the average dermatologist.
What should the AI be able to distinguish?	AI makes recommendations for or against biopsy but gives no indication of a precise diagnosis.	AI distinguishes between melanomas and nevi .
How should the AI assessment be integrated into routine diagnostics?	The physician first decides independently and obtains a second opinion from the AI only in case of doubt .	The physician first decides independently and obtains a second opinion from the AI only in case of doubt .
Who should be able to trace the AI assessment?	The physician is able to trace the AI assessment.	The physician and the patient are able to trace the AI assessment.
	<input type="radio"/>	<input type="radio"/>

Fig 1. Example choice tournament of the present adaptive choice-based conjoint study design. The survey was conducted in German, and this example choice tournament was translated into English for this illustration. *AI*, Artificial intelligence.

dermatologists preferred a multiclass differentiation among various disorders (see Supplementary Results, available via Mendeley at <https://data.mendeley.com/datasets/2chcwnhpwj/1>). Specifically, the differentiation between melanoma and nevi, which has been the primary focus of AI research in dermatology,³ is considered insufficient. Consequently, there is a need for prospective studies evaluating AI-performance in multiclass assessments.

Current AI research is mainly performance-oriented (eg, International Skin Imaging Collaboration challenges⁴). However, patients and dermatologists require AI-systems that explain the rationale behind their decision-making and are at least somewhat traceable for patients and dermatologists. This growing demand for explainable AI poses a key challenge for future research since state-of-the-art technology does not fully explain the reasoning behind its decisions due to the AI black box phenomenon.⁵

Moreover, it is crucial to acknowledge that a substantial number of respondents in this survey study had a personal history of melanoma and therefore may have different perspectives on AI for skin cancer diagnostics compared to the general population (see Supplementary Fig 4, available via Mendeley at <https://data.mendeley.com/datasets/2chcwnhpwj/1>). To mitigate this potential bias, future studies should prioritize the recruitment of patients with no or other types of skin cancer.

In conclusion, the prioritization of AI-systems with increased explainability and traceability (ie, making them understandable) along with the call for multiclass decision-making, highlights that AI-systems need to evolve beyond pure performance advancements. Adhering to these criteria will be

pivotal for fostering potentially more successful clinical adoption.

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Conflicts of interest

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Understanding the patient experience of drug reaction with eosinophilia and systemic symptoms: A qualitative study



To the Editor: Drug reaction with eosinophilia and systemic symptoms (DRESS) is a delayed immune-mediated drug reaction, classically presenting with fever, rash, eosinophilia, and organ involvement.¹ Treatment relies on termination of the culprit drug, corticosteroids, and, more recently, steroid-sparing agents.² With the physical and mental health sequelae of DRESS largely unknown,³ this qualitative study aimed to understand adult DRESS survivors' lived experiences and perspectives.

Patients with DRESS were identified from Mass General Brigham using informatic methods.⁴ Participants were selected from specialist-diagnosed, manually reviewed cases for 1-on-1, 30-minute, virtual, semistructured interviews. Recordings were transcribed, and 2 independent coders performed a thematic approach to analysis using the Framework