Artificial Intelligence Adoption in Dermatology
Position Statement

The Canadian Dermatology Association (CDA) recognizes the transformative potential of artificial intelligence (AI) in healthcare, particularly within dermatology. AI technologies, including machine learning and deep learning algorithms, hold promise for increasing access to care, enhancing clinical decision-making, streamlining workflows, and improving patient outcomes.

Studies have demonstrated that convolutional neural networks can improve the diagnostic accuracy of skin tumors and assess the severity of inflammatory skin conditions.[1-3] The emergence of large language models has further highlighted AI's potential to enhance clinical decision making, medical education and administrative efficiency.[4]

Canada's vast geography and diverse population create unique challenges in delivering dermatological care, particularly to remote and underserved communities. The emergence of AI presents an opportunity to help overcome these barriers and improve[5] access to specialized care across the country. Given this context, Canadian dermatologists are well-positioned to become leaders in responsibly developing, implementing and governing these technologies.

The CDA is committed to supporting the integration of AI tools that meet the real-world needs of dermatologists and patients while ensuring equitable access to these technologies for all Canadians. Given the pace of technological and regulatory changes, the CDA commits to revisiting and updating this position statement on a regular basis to ensure continued relevance and accuracy.

Principles for AI Adoption in Dermatology

1. **Augmenting, Not Replacing Clinical Expertise**
   AI tools are intended to support dermatologists by enhancing efficiency and clinical decision-making.[6] Final interpretation and application of AI-generated insights remain the responsibility of the clinician, who integrates these tools with clinical context, patient history, and professional judgment. The human aspects of care—including empathy, communication, and shared decision-making—remain essential components of high-quality dermatologic care.

2. **Patient-Centric Focus**
   AI applications in dermatology must prioritize patient well-being by improving access to care, diagnostic accuracy, and clinical outcomes. These technologies should be transparent and explainable to both patients and clinicians to foster trust and understanding. [7] Transparency for patients could follow a model similar to nutrition labels on food, providing clear information about the training and validation datasets, including representation of skin of colour.[8]

3. **Equity and Diversity**
   AI systems must function effectively across all demographic groups, socioeconomic status, skin tones and disease types. Addressing biases in training datasets is crucial to ensuring fairness, inclusivity, and broad applicability.[9-11]

4. **Safety and Validation**
   AI systems must undergo rigorous prospective validation in real-world clinical settings along with ongoing post-deployment monitoring, to ensure their safety, accuracy, and reliability over time. These models must evolve with changing patient demographics, new data and real-world feedback from clinicians and patient outcomes.[12] Clinicians should prioritize using services validated by reputable independent regulatory bodies with a structured evaluation framework such as Canada Health Infoway.

5. **Privacy and Data Security**
   Medical AI tools are often trained on patients' private health information. Thus, these tools must adhere to robust deidentification processes, ethical data handling practices, and Canadian and local privacy laws. Patient data must remain within Canada. If a company directly or indirectly transfers patient data to entities operating outside of Canada, explicit informed consent is needed from the patient. Transparency related to data use, storage, and sharing is fundamental to building patient trust.[13]

6. **Interdisciplinary Collaboration**
   Successful AI integration in dermatology depends on collaboration across the healthcare ecosystem.[14,15] Key stakeholders, including physicians, AI developers, ethicists, regulators, healthcare administrators both within and outside hospitals, industry partners, and patients, must work together throughout the development and implementation process. This collaborative approach ensures that AI tools not only meet clinical needs and ethical standards but also serve the broader interests of patients and society.

7. **Education and Training**
   The integration of AI education into dermatology residency programs and continuing medical education is essential.[5] Current and future dermatologists should understand AI fundamentals, limitations, and practical applications in clinical practice, along with the legal and ethical frameworks guiding its use in medicine. As trainees increasingly use AI tools to generate differential diagnoses, care plans, and clinical notes, universities and residency programs should adopt guardrails and assessments that prioritize independent clinical reasoning and the development of a strong medical knowledge base over simple answer retrieval.

8. **Implementation**
   The successful integration of AI requires technical infrastructure, funding, and support systems. This includes access to diverse electronic medical record systems, and clinical decision support tools. Ensuring that dermatology practices, urban and rural, have the capacity to adopt and sustain AI tools is critical to realizing their potential.

9. **Legal, Ethical and Governance Considerations**
   Clear delineation of responsibility is essential when AI tools are used in clinical decision-making. Guidance around liability, appropriate informed consent, documentation of AI-assisted decisions, and medicolegal protections should be addressed in future policy development.[16] At the same time, effective governance is required to ensure that these legal and ethical safeguards are upheld in practice.

Call to Action

Creating Diverse and Inclusive Datasets

- Collaborative efforts among academic institutions, industry, and healthcare providers are needed to create datasets reflecting the full spectrum of demographic groups, skin tones, and skin conditions for Canadian patients.
- Data repositories and ethical data-sharing agreements among Canadian academic institutions should be promoted to ensure diversity in AI model development.

Establishing Ethical and Regulatory Frameworks

- Canadian professional organizations should lead in creating standardized guidelines for AI development and implementation in dermatology, with transparency, equity and patient privacy at the core of these frameworks.
- Strong governance is needed to ensure safe and responsible use, including a national oversight body to audit AI tools and support professional self-regulation.

Supporting Continued Research and Education

- Governments, academic institutions, and hospitals should invest in research infrastructure and the digitalization of medicine to refine AI capabilities and expand applications in dermatology.
- Academic Institutions and Canadian professional organizations should implement programs for continuous monitoring and evaluation of deployed machine learning systems to ensure ongoing accuracy, safety, and effectiveness.
- Educational initiatives should target patients, dermatologists and AI developers to bridge knowledge gaps and foster collaboration.

Encouraging Clinician Engagement

- Dermatologists are encouraged to actively question and engage with their institutions about the use of AI in clinical practice to ensure that these tools address real clinical needs.
- Clinicians are invited to experiment with tools such as AI scribes, AI-enabled diagnostic tools, or large language models to better understand their opportunities, limitations, and implications in dermatology.

Definitions

Artificial intelligence: Computer systems capable of performing tasks typically requiring human intelligence, such as reasoning, pattern recognition and problem solving.

Machine learning: A subset of artificial intelligence that can learn and improve by identifying patterns in data, without requiring explicit programming for each task.

Deep learning: A subset of machine learning that uses neural networks to analyze complex data and identify patterns automatically.

Convolutional neural networks: A subset of deep learning that excels at analyzing visual data, often used to process and recognize patterns in images.

Large language models: A subset of deep learning trained on large amounts of text data that can understand and generate human-like texts.

Training and validation datasets: The training dataset teaches the algorithm to recognize patterns, while the validation dataset tests the algorithm's performance on new, unseen examples to ensure it generalizes well to real-world scenarios.

Bibliography

1. Cai ZR, Kim J, Rezaei SJ, et al. Assessing the performance of artificial intelligence models in evaluating inflammatory skin disease severity: a systematic review and meta-analysis. *British Journal of Dermatology*. 2025/10/17;193(5)doi:10.1093/bjd/ljaf250
2. Krakowski I, Kim J, Cai ZR, et al. Human-AI interaction in skin cancer diagnosis: a systematic review and meta-analysis. *npj Digital Medicine 2024 7:1*. 2024–04–09;7(1)doi:10.1038/s41746-024-01031-w
3. Choy SP, Kim BJ, Paolino A, et al. Systematic review of deep learning image analyses for the diagnosis and monitoring of skin disease. *npj Digital Medicine 2023 6:1*. 2023–09–27;6(1)doi:10.1038/s41746-023-00914-8
4. Omiye JA, Gui H, Rezaei SJ, Zou J, Daneshjou R. Large Language Models in Medicine: The Potentials and Pitfalls. *Annals of Internal Medicine*. 2024–01–30;177(2)doi:10.7326/M23-2772
5. Abdulnour R-EE, Gin B, Boscardin CK. Educational Strategies for Clinical Supervision of Artificial Intelligence Use. *New England Journal of Medicine*. 2025–08–21;393(8)doi:10.1056/NEJMra2503232
6. Augmented intelligence in medicine. Accessed January 15, 2026. https://www.ama-assn.org/practice-management/digital-health/augmented-intelligence-medicine
7. Chanda T, Hauser K, Hobelsberger S, et al. Dermatologist-like explainable AI enhances trust and confidence in diagnosing melanoma. *Nature Communications 2024 15:1*. 2024–01–15;15(1)doi:10.1038/s41467-023-43095-4
8. Li Y, Taylor M, Chmielinski KS, et al. Improving dataset transparency in dermatologic Artificial Intelligence using a dataset nutrition label. *npj Digital Medicine 2025 8:1*. 2025–11–05;8(1)doi:10.1038/s41746-025-02125-9
9. Daneshjou R, Vodrahalli K, Novoa RA, et al. Disparities in dermatology AI performance on a diverse, curated clinical image set. *Science Advances*. 2022–08;8(32)doi:10.1126/sciadv.abq6147
10. Kim J, Cai ZR, Chen ML, Simard JF, Linos E. Assessing Biases in AI Chatbot Responses. *JAMA Network Open*. 2023/10/02;6(10)doi:10.1001/jamanetworkopen.2023.38050
11. Omiye JA, Lester JC, Spichak S, et al. Large language models propagate race-based medicine. *npj Digital Medicine 2023 6:1*. 2023–10–20;6(1)doi:10.1038/s41746-023-00939-z
12. Wong A, Sussman JB. Understanding Model Drift and Its Impact on Health Care Policy. *JAMA Health Forum*. 2025/08/01;6(8)doi:10.1001/jamahealthforum.2025.2724
13. Pan-Canadian AI for Health (AI4H) Guiding Principles. Accessed January 15, 2026. https://www.canada.ca/en/health-canada/corporate/transparency/health-agreements/pan-canadian-ai-guiding-principles.html

14. Bajwa J, Munir U, Nori A, Williams B. Artificial intelligence in healthcare: transforming the practice of medicine. *Future Healthcare Journal*. 2021/07/01;8(2)doi:10.7861/fhj.2021-0095
15. Bazoukis G, Hall J, Loscalzo J, Antman EM, Fuster V, Armoundas AA. The inclusion of augmented intelligence in medicine: A framework for successful implementation. *Cell Reports Medicine*. 2022/01/18;3(1)doi:10.1016/j.xcrm.2021.100485
16. The medico-legal lens on AI use by Canadian physicians. Accessed January 15, 2026. https://www.cmpa-acpm.ca/en/research-policy/public-policy/the-medico-legal-lens-on-ai-use-by-canadian-physicians