

Artificial Intelligence in Aesthetic Dermatology: Current Applications and Future Perspectives

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Aesthetic dermatology is a growing field, inspired by how ideals of beauty evolves, driven by increasing societal demand and technological innovation. Where clinical dermatology revolves around diagnosis and treatment of skin diseases, it is mainly centered on overall skin health and physical appearance, shaping how patients perceive themselves and their mental health. With the distinctive fusion of medical expertise with artistic insight, it helps clinicians to address skin laxity, wrinkles, aging and pigmentation providing them with a customized treatment plan. However, Aesthetic assessment and treatment outcomes have always worked on subjective measures because validated objective assessment tools are limited.¹ This requires the need for more objective and standardized approaches in aesthetic dermatology.

Artificial intelligence has emerged in this space not only as a solution to that problem, but as a tool that can help manage it. This distinction matters. The role of AI in aesthetic medicine is not that it resolves the human dimensions of the clinician–patient relationship, but that it offers something the field has long lacked: a scalable and consistent means of objective measurement.² By this, it has added an objective measure to clinical expertise improving patient care.

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Computer vision algorithms based on clinical imaging datasets can now recognize and grade features, such as wrinkle depth, areas of dyspigmentation, textural heterogeneity and acne lesion counts, meeting the objective standards. Office or clinics-based advanced imaging tools like VISIA Skin Analysis System³ and apps like Skiana[®] and PROVEN Beauty[®] for home use, now make it possible to map skin in detail, track changes over a period of time, and educate patients to use their own data rather than generic advice or guesswork. Artificial Intelligence now does much more than image analysis, it combines multiple data sources in real time like skin type, past treatments, lifestyle variables, and even genetics,^{4,5} data a single clinician could not combine alone. In aesthetics, it is a real breakthrough since patient trust and realistic expectations are as important as the treatment itself.

Another exciting clinical use we are seeing is in procedural planning. Now AI tools can map facial symmetry and main anatomical points that can help doctors in placement of botox and dermal fillers with more precision. However, technology still cannot be a replacement of an expert injector's eye regarding proportion and facial dynamics. Deep learning models such as ModiFace and Crisalix also make the patient-doctor conversation smoother and more fruitful. As these models learn from larger sets of data, they also aid in reducing risks, making aesthetic care safer and more evidence-based.⁶

Biosensors are emerging as a promising new tool in

aesthetic dermatology, giving doctors a way to assess skin health in real time and tailor treatments to each patient. These non-invasive sensors can measure skin hydration, temperature, pH, elasticity, and even inflammatory markers while a procedure is going on. During treatments like laser therapy or radiofrequency microneedling, doctors can now adjust the settings and technique on the spot depending on what skin needs at that time, that were previously impossible.^{7,8} Coupled with AI-driven analytics, it opens the door toward a precision-based aesthetics. The clinical potential is real, but widespread adoption will still take some time.

The conversation about AI in aesthetic dermatology has sometimes centered on technical grounds such as accuracy rates, model architecture and dataset size. Yet the more consequential questions are ethical and structural domains. Who bears responsibility when an AI-assisted recommendation leads to a poor or adverse outcome? How do we ensure patients are properly informed when algorithmic tools shape their treatment decisions? And what obligations do developers and clinicians hold in ensuring that these systems do not amplify or replicate existing disparities?^{9,10}

For progress on all of these fronts, we need better training data, we require datasets that are diverse and truly representative of the patients who walk into aesthetic clinics on daily basis.. This requires deliberate effort and, in many cases, international collaboration to build datasets. At the same time, we need AI models that are transparent and can explain themselves. Clinicians should be able to see the reasoning behind a particular recommendation that makes clinical sense. Transparency is a feature to be added as a scientific priority. And finally we need regulation that should be shaped by practicing clinicians, not just handed down by tech companies. This kind of guidance is needed if we want AI to be fair, safe and really useful at the point of care.

AI is inevitable and has an important place in aesthetic practice. But Clinicians must stay in the forefront, taking AI as an adjunctive tool rather than the replacement of clinical judgment. The future of AI will

not only rely on the continued technological advancements but also on building transparent and ethical AI frameworks that can be trusted by both patients and clinicians. Moreover, there is a great need to train these systems on diverse and representative datasets to reduce bias and maintain inclusivity. If we balance innovation with ethics, AI has great potential to transform aesthetic medicine while maintaining human expertise still playing central role in patient care and every aesthetic decision.

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