The new era of advanced AI-powered aesthetics

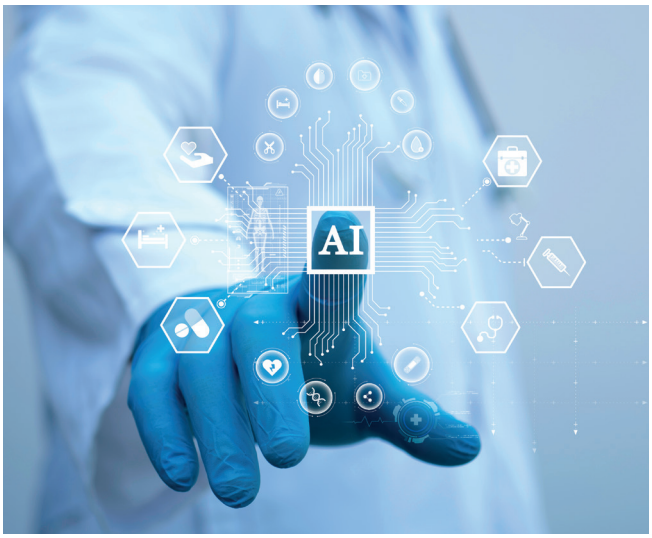
BY JENNIFER PEARLMAN

"AI is the most powerful technology force of our time." Jensen Huang, Nvidia CEO.

The 101 on AI

Artificial intelligence (AI) is set to redefine our social, economic and healthcare infrastructure. Artificial intelligence represents machine learning designed to be intuitive and predictive. Generative AI technologies drive many familiar applications like speech recognition, virtual assistants, and computer vision.

With the introduction of ChatGPT to the market in November 2022 by OpenAI, a rapid global uptake of the technology ensued. Within five days, the chatbot had attracted over one million users [1]. ChatGPT offered users an advanced form of generative AI as a powerful chatbot built on top of a foundational large language model (LLM). Within a very short time, ChatGPT has already begun to revolutionise the world. And many experts predict that its greatest potential to benefit humanity lies in AI's potential to transform healthcare.



The transformative potential of AI

The transformative potential of AI in healthcare can be considered in six key domains:

1. Augmented patient connectivity

AI-enabled platforms allowing for enhanced virtual care, monitoring, and communication are already being employed in various healthcare systems [2]. Accelerated adoption and development of virtual and remote healthcare platforms was an indirect consequence of public health measures and pandemic-related restrictions. With generative AI, improved patient monitoring and connectivity is enabled using ambient sensors and predictive models to alert providers to early signs of distress or disease. A system-wide AI solution could allow for better interconnectedness of care and in turn enhanced patient outcomes.

2. Enhanced diagnostics

Generative AI can be used to enhance the delivery of precision medicine by integrating and interpreting the vast and expanding array of biomarkers and data sets including genomic, proteomic, epigenomic, microbiome, hormonal, nutritional, metabolic, and immune profiles with additional health data arising from wearables. Truly bespoke biomarker driven medicine, enabled by expertly designed generative AI, will translate complex input into a precision treatment plan.

3. Precision therapeutics

Before AI-powered precision therapies can be designed, AI must first unlock the cellular and molecular basis of disease including cancer, cardiovascular disease, neurodegenerative diseases and rare genetic diseases. AI-driven digitisation of biology is forming the basis for the complex problem solving required to design precision therapeutics. Immunology, genomics and cell biology are key areas where AI is transforming our understanding of function and disease [3]. Matching pathophysiology to the vast library of approved drugs to repurpose for new indications and targets as well as proactively searching drug candidate databases and research molecules. Artificial intelligence is rapidly allowing a deeper understanding of the aetiology and pathophysiology of disease, which in turn is fueling a renaissance in precision therapies as the future of medicine.

4. Predictive health and monitoring

Interpretive AI, driven by data from wearables or a simple scan from your mobile device's camera or from a 'Smart' AI-powered mirror, can provide useful data on health status, disease risk and ageing markers. AI-powered predictive health platforms can provide an informed 'nudge' to direct the user to suitable medical care. The predictive value of AI can help address large gaps in our healthcare system including wait times, remote and rural areas, and shortage of care.

5. AI-enhanced clinical care

Generative AI applications are already transforming how clinical care is being provided across surgical and medical specialties. There are over 1000 AI or machine learning enabled devices currently registered with the Food & Drug Administration (FDA). The vast majority of these systems are in the field of radiology where AI-enabled systems are outperforming the most experienced radiologist's interpretative abilities. Combination use of AI visualisation and diagnostic systems with robotic surgical platforms promises, not only greater precision and accuracy in surgical care, but enhanced safety.

6. AI-powered drug discovery

Machine learning is driving a new phase of targeted drug discovery and personalised medicine. AI-enabled precision oncology is emerging as a novel approach to treat rare cancers

using precise and targeted therapies [4]. What once was a high-risk, high-cost slow process of drug discovery and development is being transformed by the power of AI.

AI in aesthetic medicine

Generative AI promises transformative changes to the aesthetic industry, revolutionising personalised beauty experiences for augmented consumer journeys, custom tailored to one's individualised needs and goals. Data drives knowledge-based generative AI solutions which, in turn, can be designed to augment rather than replace the expert aesthetic healthcare provider, across the treatment journey from patient recruitment, assessment and treatment to follow-up.

Generative AI-powered facial analytic systems are rapidly emerging onto the aesthetic market [5]. These systems use the advanced camera systems on consumer's mobile devices to scan the face with an AI-enabled assessment of key metrics including skin quality, symmetry, proportionality, pigment, vascularity, ageing, and subsequently develop treatment plans, recommendations and educational guidance. In clinics, imaging systems can provide more advanced analysis, including neurovascular landmarks, biomarkers of ageing, and skin quality assessment for the face, scalp, and body. When combined with other health indicators, questionnaires and biomarkers, the predictive value of AI-powered clinical-grade facial analysers and smart mirrors can be greatly enhanced.

Conclusion

The potential of AI to transform healthcare and aesthetic medicine is vast. As AI continues to evolve, its predictive power and potential value will change the entire landscape of the consumer experience and patient journey. While it is unlikely that AI will replace human medical experts, providers that incorporate AI into their practice will likely replace those that do not.

References

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Declaration of competing interests:

The author is Co-Founder and Director of Business Development for Healthspan Digital and Medical Advisor for AI Nexus Healthcare.