

## Artificial Intelligence for Plastic Surgeons

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ChatGPT is a new open source AI platform released by its parent company, OpenAI, on November 30, 2022.<sup>1</sup> The below text was the output from ChatGPT in response to the query “write an article on the role of artificial intelligence on plastic surgery research” entered on January 30, 2023.

“Artificial intelligence (AI) has been revolutionizing various industries and research fields, including plastic surgery. AI has been playing a crucial role in facilitating plastic surgery research, advancing the accuracy and speed of diagnosis and treatment plans, and improving patient outcomes.

1. Diagnosis and treatment planning: AI algorithms can be trained to analyze medical images and diagnose diseases, including skin conditions and plastic surgery conditions. For example, AI can assist in analyzing 3D images to plan reconstructive surgeries, making the process faster and more accurate.
2. Surgical simulation: AI-powered surgical simulation can be used to plan surgeries and predict outcomes. This technology can also provide doctors with a virtual environment for practicing surgeries, reducing the risk of surgical errors.
3. Patient outcomes: AI algorithms can predict patient outcomes based on the patient’s medical history, anatomy, and other factors. This technology can help doctors make informed decisions and improve patient outcomes.
4. Personalized medicine: AI can assist in creating personalized treatment plans based on individual patient data, allowing doctors to provide the best possible care to their patients.

AI has been playing a significant role in advancing plastic surgery research and providing better patient outcomes. However, it is important to note that AI is just a tool and should not replace the expertise and experience of plastic surgeons. The role of AI in plastic surgery should be to enhance and support the work of plastic surgeons, not replace them.”

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Now that AI is increasingly available to all users, there has been exponential development and usage across disciplines. AI is a branch of computer science in which algorithms learn from data iteratively to extract high level information from inputs without the need for explicit programming. ChatGPT is an AI neural network designed for natural language processing tasks. In addition to generating human-like text, AI can be used to generate images from descriptive language, using the DALL-E 2 or similar platforms. In addition to the AI use cases that ChatGPT puts forth above, there are many other potential applications relevant to medical practice: developing code to analyze datasets,<sup>2</sup> generating educational material for patients and trainees, functioning as a scribe service,<sup>3</sup> and preparing written communication, including emails and research articles (including this one!).

Radiologic image classification is an area in healthcare where AI has made significant advances. AI now performs comparably to clinicians with fracture diagnosis.<sup>4</sup> AI can also be used to optimize nondiagnostic operational tasks, such as evaluating the appropriateness of imaging and triaging patients. This allows many avenues for opportunities to provide diagnostic radiology services more efficiently.

AI has its limitations. One significant limitation to the use of AI in clinical medicine is the propagation of biases from the datasets into the AI outputs.<sup>5</sup> Understanding the datasets used to develop algorithms is important to mitigate biases. These biases can potentially limit the usefulness of AI with predictive or analytical functions.

What are some discrete examples of how AI can assist the practicing plastic surgeon in the near term? AI can function as a virtual scribe and produce clinic notes and operative reports by extracting everything that is said in these contexts. It can also function as a radiologist and provide immediate reads on X-rays and CT scans. AI can help plastic surgeons provide personalized care to their patients by introducing more nuanced risk stratification from patient data and optimizing patient education. In the long term, AI has many potential uses that have yet to be realized.

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*The author has no financial interest to declare in relation to the content of this article.*

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*does not fulfill the criteria as a study author, given its inability to take responsibility for the content and integrity of this article.*

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