

GLOSSARY: Artificial Intelligence in Health Care

Artificial intelligence (AI) is a major area of focus for stakeholders across the health care ecosystem – such as patient advocates, tech innovators, health systems, and policymakers. AI has the potential to augment patient care and reduce administrative workloads for providers, but there are also inherent risks for patient outcomes, data privacy, and health inequities. This resource serves as a glossary of key concepts related to the use of AI in health care, which is crucial to learn in order to understand and engage in the growing policy landscape around it. **It should be noted that many of the terms below are not static and the definitions provided in this document are one of many variations.**

- ★ **Administrative Burden:** “Healthcare workers spend a lot of time doing paperwork and other administrative tasks. AI and automation can help perform many of those mundane tasks, freeing up employee time for other activities and giving them more face-to-face time with patients. For example, generative AI can help clinicians with note-taking and content summarization that can help keep medical records as thorough as possible. AI could also help with accurate coding and sharing of information between departments and billing.” (IBM)
- ★ **Algorithm:** “A set of rules or commands that a computer follows to perform calculations or other problem-solving operations.” (American Medical Association)
- ★ **Algorithmic Bias:** A form of prejudice towards a “person, thing, or entity” that “occurs when there is an underlying problem or flaw with the algorithm used to deliver outputs.” (American Medical Association)
- ★ **Artificial Intelligence (AI):** “The ability of computers to perform tasks that are typically associated with a rational human being—a quality that enables an entity to function appropriately and with foresight in its environment.” (American Medical Association)
 - ★ It should be noted that AI itself does not have a consistent definition and it is often used as a term to encompass a spectrum of different things.
- ★ **Assurance Labs:** “Places where AI model developers can develop and test AI models according to standard criteria that would be defined with regulators.” (STAT)
 - ★ USofCare notes that some experts have pointed out the potential gaps of these assurance labs in addressing health equity.
- ★ **Augmented Intelligence:** “Computational methods and systems that enhance human capabilities and decision-making.” (American Medical Association)
- ★ **Black Box:** “The inability of a user to understand the specific steps taken by an algorithm that lead to an algorithm’s final output.” (American Medical Association)
- ★ **Chatbot:** “A computer program that simulates human conversation with an end user. Not all chatbots are equipped with artificial intelligence (AI), but modern chatbots increasingly use conversational AI techniques such as natural language processing (NLP) to understand user questions and automate responses to them.” (IBM)

- ★ **Cognitive Computing**: “Systems that simulate human reasoning and thought processes to augment human cognition. Cognitive computing tools can help aid decision-making and assist humans in solving complex problems by parsing through vast amounts of data and combining information from various sources to suggest solutions. Cognitive computing’s focus on supplementing human decision-making power makes it promising for various health care use cases, including patient record summarization and acting as a medical assistant to clinicians.” (Health IT Analytics)
- ★ **Computer Vision**: “Computer vision is a field of computer science that focuses on enabling computers to identify and understand objects and people in images and videos. Like other types of AI, computer vision seeks to perform and automate tasks that replicate human capabilities. In this case, computer vision seeks to replicate both the way humans see, and the way humans make sense of what they see.” (Microsoft)
- ★ **Conversational AI**: “Refers to technologies, such as chatbots or virtual agents, that users can talk to. They use large volumes of data, machine learning and natural language processing to help imitate human interactions, recognizing speech and text inputs and translating their meanings across various languages.” (IBM)
- ★ **Deep Learning**: “A subtype of machine learning that describes algorithms that operate on multi-layered ‘neural networks’ modeled on the human brain. Deep learning algorithms can extract complex patterns from input data.” (American Medical Association)
- ★ **Electronic Health Records (EHRs)**: “An electronic version of a patient's medical history, that is maintained by the provider over time, and may include all of the key administrative clinical data relevant to that person's care under a particular provider, including demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates access to information and has the potential to streamline the clinician's workflow. The EHR also has the ability to support other care-related activities directly or indirectly through various interfaces, including evidence-based decision support, quality management, and outcomes reporting.” (Centers for Medicare & Medicaid Services)
- ★ **End User**: “The ultimate consumer of a finished product.” (Merriam-Webster)
 - ★ The end users of health care AI are people and patients.
- ★ **Federated Learning**: “A decentralized approach to training machine learning models; rather than aggregating all data together, federated learning uses local devices with local data to train algorithms.” (American Medical Association)
- ★ **Foundational Models**: “Models that are trained on large datasets—and thus broadly applicable—and can be adjusted for specific applications. Typically used for generative artificial intelligence; LLMs are one type of foundational model.” (American Medical Association)
 - ★ **Large Language Models (LLMs)**: “Models that are a subset of generative AI and have the ability to understand and generate human language.” (American Medical Association)
- ★ **Generative AI**: AI systems that are designed to generate “novel text, images, videos, or other outputs, typically based on foundational models.” (American Medical Association)

- ★ **Hallucinations:** “Outputs from an AI model that are nonsensical, misrepresent data from the training dataset, and/or are false.” (American Medical Association)
 - ★ Although “hallucination” is the technical term, USofCare acknowledges that this may not be the most equitable name used to describe this phenomenon as it may create negative connotations for people who have diagnoses related to hallucinations.
- ★ **Machine Learning (ML):** “A subtype of AI in which complex algorithms are trained to make predictions about future outcomes. Machine learning can be supervised or unsupervised.” (American Medical Association)
 - ★ **Supervised Machine Learning:** “A training technique used to train machine learning models. Supervised learning trains algorithms with labeled data.” (AMA)
 - ★ **Unsupervised Machine Learning:** “A training technique used to train machine learning models. Unsupervised learning trains algorithms with unlabeled data.” (American Medical Association)
 - ★ **Semi-Supervised Machine Learning:** A training technique used to train machine learning models, “relying on a mix of supervised and unsupervised learning approaches during training.” (Health IT Analytics)
 - ★ **Reinforcement Machine Learning:** “A machine learning training method that uses rewards and punishments to teach desired and undesired behaviors as part of model training.” (American Medical Association)
- ★ **Narrow AI:** “Algorithms designed to accomplish specific (versus broad) tasks.” (American Medical Association)
- ★ **Natural Language Processing (NLP):** “An algorithm’s ability to interpret and/or translate language.” (American Medical Association)
- ★ **Natural Language Understanding (NLU):** A subset of NLP “concerned with computer reading comprehension, focusing heavily on determining the meaning of a piece of text. These tools use the grammatical structure and the intended meaning of a sentence — syntax and semantics, respectively — to help establish a structure for how the computer should understand the relationship between words and phrases to accurately capture the nuances of human language.” (Health IT Analytics)
- ★ **Natural Language Generation (NLG):** A subset of NLP “used to help computers write human-like responses. These tools combine NLP analysis with rules from the output language, like syntax, lexicons, semantics, and morphology, to choose how to appropriately phrase a response when prompted. NLG drives generative AI technologies like OpenAI’s ChatGPT.” (Health IT Analytics)
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- ★ **Neural Network**: “Software constructions utilized in deep learning included in an algorithm that are modeled after the way adaptable neurons in the human brain function.” (American Medical Association)
 - ★ **Artificial Neural Networks (ANNs)**: “ANNs utilize a layered algorithmic architecture, allowing insights to be derived from how data are filtered through each layer and how those layers interact. This enables deep learning tools to extract more complex patterns from data than their simpler AI- and ML-based counterparts.” (Health IT Analytics)
 - ★ **Deep Neural Networks (DNNs)**: “DNNs are a type of ANN with a greater depth of layers. The ‘deeper’ the DNN, the more data translation and analysis tasks can be performed to refine the model’s output.” (Health IT Analytics)
 - Convolutional Neural Networks (CNNs)**: “CNNs are a type of DNN that is specifically applicable to visual data. With a CNN, users can evaluate and extract features from images to enhance image classification.” (Health IT Analytics)
 - ★ **Generative Adversarial Networks (GANs)**: “GANs utilize multiple neural networks to create synthetic data instead of real-world data. Like other types of generative AI, GANs are popular for voice, video, and image generation. GANs can generate synthetic medical images to train diagnostic and predictive analytics-based tools.” (Health IT Analytics)
 - ★ **Recurrent Neural Networks (RNNs)**: “RNNs are a type of ANN that relies on temporal or sequential data to generate insights. These networks are unique in that, where other ANNs’ inputs and outputs remain independent of one another, RNNs utilize information from previous layers’ inputs to influence later inputs and outputs. RNNs are commonly used to address challenges related to natural language processing, language translation, image recognition, and speech captioning. In healthcare, RNNs have the potential to bolster applications like clinical trial cohort selection.” (Health IT Analytics)
- ★ **Predictive AI**: AI systems that are “designed to assess historical data, discover patterns, observe trends, and use that information to predict future trends.” (IBM)
- ★ **[Medical] Record Summarization**: “A process that uses artificial intelligence (AI) to condense complex patient information, is currently used in health care settings for tasks such as creating electronic health records and simplifying medical text for insurance claims processing.” (Penn State University)