AI Best Practices and Uses Cases in Healthcare

AI is advancing healthcare in multiple ways, from diagnosing diseases and helping to find new cures to streamlining administrative processes and improving workflows. Along with its enormous promise to transform healthcare, AI brings new potential risks. It is essential that these risks be managed through appropriate guardrails while allowing the full potential of AI in healthcare to be realized through ongoing innovation. Below we outline some AI best practices designed to achieve this goal, as well as describe some current and potential use cases for AI in healthcare.

A. AI Best Practices

Build Trust. Trust is the underpinning of the healthcare system, and any deployment of AI should be designed and implemented in a manner that builds trust by adhering to certain key principles such as transparency, accountability, fairness and respect for individual rights and privacy. Individuals should be assured that AI is deployed in an ethical manner with the ultimate goal of benefitting society.

Human Involvement. Humans should be involved throughout the AI life cycle, from the initial design to deployment to ongoing monitoring of results. This is essential not only to maintain trust, but also to ensure that AI tools perform as intended. AI should facilitate, not replace, critical decision-making, and AI solutions should be developed with input from and in collaboration with clinicians and others in the healthcare industry that will use them. It is through combining the respective strengths of AI and humans that the AI can achieve its highest and best use in healthcare.

Robust privacy and security controls. Privacy and security of data should be of the highest priority. The concept of privacy by design and default should be the guiding principle in AI development and deployment. Robust privacy and security protocols should be implemented, including use limitations, physical, administrative, and technical safeguards, data minimization, cybersecurity controls, and ongoing privacy and security training of personnel. Organizations should follow national standards for the collection, processing, and transfer of personal information not already subject to HIPAA, including standards for the use and protection of personal data in AI solutions, such as the NIST Cybersecurity Framework.

High Quality Data. The performance of AI is directly dependent on the quality of the data inputs that are being used to train the AI models. Training data should be as reliable, representative, and complete as possible with respect to the population it is intended to serve across a range of factors such as age, gender, ethnicity, and health status. From the inception of data collection to the use of the data to produce insights, the goal should be to build algorithms that are reliable, accurate, unbiased, and that protect the patient from harm.

Ongoing Monitoring and Evaluation. Performance benchmarks should be established to ensure that the AI model is performing as intended and that decision-making through it is appropriate. Decisions should be reviewed for potential bias and model outputs should be continuously monitored to avoid drift, overtraining, AI hallucination and other AI risks.

Transparency. Disclosure and openness are essential to promote trust and acceptance of AI in health care. AI developers should explain how their products work, including information on both their capabilities and limitations. This is important not only to set realistic expectations, but so that healthcare organizations can make informed decisions as to how to best use these tools. Healthcare organizations, in turn, should disclose to patients and consumers when they are interacting with AI tools.

Oversight and governance. A governance body should be put in place to oversee the development and deployment of AI in the organization. This body should establish policies and standards for the safe and responsible use of AI in the organization, including controls to identify and mitigate potential risks, ensure data integrity, protect privacy, and evaluate performance. It should also be responsible for continuous monitoring and improvement of AI tools as well as compliance with regulatory requirements.

B. AI Use Cases in Healthcare[1]

AI tools are increasingly being used in health care to improve patient outcomes, enhance operational and administrative efficiency, and advance medical research. Below we provide examples of AI use cases in these three key areas.

1. Improve Clinical Care

AI is being used to facilitate clinical decision-making and improve care in many ways, from helping to diagnose diseases to improving treatments and finding new cures. Some use cases include:

[1] These use cases are drawn from a variety of sources, including Future of Health: The Emerging Landscape of Augmented Intelligence in Health Care," a presentation by Manatt and the American Medical Association, May 1, 2024; the Testimony of Peter Shen, Head of Digital & Automation, Siemens Medical Solutions USA, Inc., at United States Senate Committee on Finance Hearing on "Artificial Intelligence and Health Care: Promise and Pitfalls," February 8, 2024; and Kaiser Permanente's May 6, 2024, response to Rep. Ami Bera's RFI on "The State of AI in Healthcare."

- To perform clinical activities more accurately and quickly.
  Example:
    - Patients undergoing a CT scan for lung cancer screening can be better positioned in the CT scanner to help optimize the resulting generated images, while minimizing the time the patient spends in the scanner. This is done by AI that is built into the CT scanner technology that allows the machines to identify human anatomy.

- To identify objects, patterns, and/or characteristics within data (often images).
  Examples:
    - Radiologists reviewing the resulting lung cancer screening CT images can utilize AI-guided computer software as a companion to the clinician to identify abnormalities, including the ability to measure the density and characterize the size of suspicious nodules that were previously not possible to visualize without the assistance of AI.

    - A physician orders an X-ray for a patient who presents with pain, swelling, and limited leg mobility. An AI tool can review the X-ray and identify an incidental nodule for further analysis by a radiologist.

    - Using computer vision programs to help clinicians identify subtle features that may be associated with increased risk of diseases. For example, AI-enabled imaging of the retina can be used to predict the risk of cardiovascular disease and stroke.

- To predict or forecast future events based on historical data and patterns.
  Examples:
    - A patient is discharged after hospitalization for heart failure. Using historic heart failure readmission rates and the patient's clinical data, an AI tool can predict the risk of the patient's hospital readmission.

    - AI tools can measure changes in brain volume over time (a predictor of neurogenerative diseases, such as Alzheimer's) by automatically segmenting different structures of the brain on an MRI image, measuring their volumes, and comparing these to data in a brain database. The AI tools can feed these comparative results into a report where deviations in volume from the norm are highlighted, providing neurologists with actionable, patient-specific volumetric data to diagnose and treat the patient more accurately.

    - Using predictive analytics to identify and address inpatient complications before they occur.

- Using predictive analytics to identify patients that would benefit from a care coordination intervention after hospital discharge which resulted in reduced hospital readmission rates.

- To summarize data inputs into shorter and more accessible outputs.
  Example:
  - A patient is admitted to an emergency room after suffering an epileptic event. A team of admitting healthcare providers review the patient's medical file to understand the patient's medical history, current medications, previous allergic reactions, and potential triggering factors. An AI tool can review the patient's medical history in totality, near- instantly identifying and summarizing key information for current clinical needs, such as recent medication changes affecting seizure threshold and a list of contraindicated drugs based on allergy history.

- To provide recommendations, guidance, or advice.
  Example:
  - A patient sees a provider every few months for a routine check-in; provider team conducts retrospective analysis of blood glucose measures from past few months. An AI tool can continually monitor a patient's blood glucose levels and (1) sends an alert to patient and provider when deviations occur and (2) provides recommended course of action (e.g., insulin level recommendation)

- To deliver safer and more accurate treatment.
  Examples:
  - To minimize the risk that healthy tissue around the cancer is not unnecessarily radiated, radiation physicists create a radiation treatment plan, which includes the tedious task of manually drawing the unique contours of the cancerous tumor. This manual contouring potentially delays the time to treatment for the patient. AI-enabled auto-contouring software can automatically detect these contours of the cancerous area, significantly speeding up the patient's time to treatment and potentially eliminating extraneous treatments.

  - Traditionally, a urologist identifies suspected areas of prostate cancer by manually reviewing written reports and pictograms of the prostate provided by radiology and as needed, acquires tissue samples from the areas in question using ultrasound-guided biopsy. An AI-tool is being developed to automatically segment suspect areas of the prostate and characterize and measure suspicious lesions in the prostate from MRI images. This qualitative and quantitative analysis may support the urologist's decision on whether a tissue biopsy is additionally required for diagnosis or if such invasive procedure can be avoided, which is significant in managing a

prostate cancer patient's well-being and minimizing unnecessary costs within the health system.

- To reduce medical errors.
  Example:
  - AI technology has been trained to analyze pill size, shape, color, and markings, as well as see broken pills, foreign objects, or anything else that should not be in the vial. The system then uses this information to appropriately send prescriptions to a pharmacist for verification. This technology helps ensure that the correct medication is dispensed.

- Population health management.
  Example:
  - AI models are used to help identify health plan members most at risk of suffering a fall, having difficulty controlling blood pressure, struggling to adhere to medication regimens, more likely to require non-obstetric hospitalization in the next 12 months, and those who should likely be included in vaccine outreach campaigns. These populations can then be targeted with additional services or information.

2. Improve Health Care Administration

There are many promising AI use cases to streamline administrative processes, increase efficiency and improve productivity. Operational and workflow improvements reduce wait times, lower administrative costs, and improve the patient and healthcare provider experience.

Some uses cases include:

- Automate actions. Reduce staff time spent on administrative work by having the system, for example, answer patient questions, schedule follow-ups, provide the status of a claim or order or assist in finding an in-network provider. Using an AI-enabled tool to assist with these tasks frees up call center personnel to focus on more complex questions and issues, reducing wait times and lowering overhead costs.

- Simplify documentation. Reduce time spent at the keyboard by having the system, for example, use machine learning and/or ambient voice technology to facilitate scribe-like capabilities in real time to improve physician-patient interaction and improve administrative efficiency. This not only saves time but allows clinicians to focus on the patient during a visit, rather than having to constantly turn to a computer screen to input notes.

- Tailor communications. Communicate better by having the system, for

example, simplify clinical notes to patient-friendly language and instructions. AI tools are particularly adept at translating clinical jargon to plain English descriptions and generating an initial draft, which will then be reviewed and finalized by the clinician. For example, AI tools may use natural language processing algorithms to optimize patient-physician communications or draft patient discharge instructions for a provider to review, reducing provider burden and improving productivity.

- Summarize the chart. Reduce time spent searching the chart by having the system summarize recent notes before a visit or highlight key details in imaging studies or converting a radiologist's audio dictation into a structured summary and applies the BIRADS classification scheme automatically.[2]

- Finding patterns. Improving fraud and abuse detection by reviewing medical and pharmacy claims to detect unusual patterns or red flags that warrant closer scrutiny. This allows auditors to focus their resources where most needed, resulting in lower health care costs as fraudulent and abusive practices are more efficiently and effectively identified and addressed.

3. Research

AI is also now also a key component in developing new drugs and cures for some of the most challenging diseases, including through precision medicine and individually tailored drug therapies. Some use cases include:

- Improving the effectiveness and reducing the cost of clinical trials.
  Examples:
  - Using AI tools to identify potential participants and streamlining the monitoring and coaching of patients.

  - Using AI algorithms to examine in detail the available scientific literature and support the identification of genetic biomarkers associated with certain diseases, enabling more effective clinical trials and shorter periods to put treatments on the market.

- Improving cost-efficiency of drug development.
  Examples:
  - Creating virtual control groups to decrease or remove the need for "real" control groups in certain clinical trials. This results in selecting fewer patients for placebo or standard treatment, thereby increasing the cost-

[2] See "Future of Health: The Emerging Landscape of Augmented Intelligence in Health Care," presentation by Manatt and the American Medical Association, May 1, 2024 ("Manatt Presentation").

efficiency of drug development.

- Analyzing vast datasets like genomic data connected to a disease, detecting potential drug targets, and predicting a drug's efficacy and its potential side effects.

- Helping researchers to analyze and repurpose existing medicines to combat specific diseases, making the development of new drugs more cost-efficient and effective.