# clearstep

# Predicting AI's Impact on Healthcare Delivery and Innovation in 2024

# AI-driven technology continues to push boundaries and shape the future of medicine.

As we move into the last of 2023 and 2024, several exciting emerging trends are poised to reshape the landscape of AI in healthcare.

Each of these trends can streamline operations, elevate patient care, and increase overall efficiency. However, emerging AI innovations have also led to demand for stricter regulations—emphasizing the need to choose a clinically sound solution that matches your organization's goals and patient intents.

# Leveraging AI-Driven Data for Resource Allocation

AI-driven resource allocation will be pivotal in optimizing healthcare operations and supporting organizations' goals to be more responsive, adaptive, and effective in meeting the evolving needs of their staff and patient populations.

### Staff Management

Considering that **labor costs have been the most significant expense for hospitals in 2023,** efficient resource allocation will be a top priority for healthcare organizations in 2024.

Computational statistical models can optimize staff schedules to match patient demand by considering factors like patient load, staff availability, and skill levels. AI can create efficient schedules that minimize labor costs while ensuring that there are enough healthcare professionals to provide quality care.

### Supply Chain Management

AI-powered supply chain management can help healthcare organizations maintain an adequate inventory of medical supplies, medications, and equipment. AI can predict demand, track expiration dates, and optimize the procurement process to reduce waste and ensure that essential items are always available.

## LEVERAGING AI-DRIVEN DATA FOR RESOURCE ALLOCATION

### Demand Forecasting

AI solutions that leverage machine learning (ML) to power predictive analytics can estimate the number of patients requiring various types of care, such as emergency room visits, surgeries, or outpatient consultations. With accurate demand forecasting, healthcare organizations can adjust staffing levels and resource allocation accordingly.

### Bed Management

Hospital bed allocation is a critical aspect of resource management. Similar to demand forecasting, ML-powered predictive analytics can provide real-time updates on bed availability and patient discharges. It can also predict when beds will become available, enabling more efficient patient admissions and reducing overcrowding in emergency departments.

# Self-Service AI Chat Assistants Becoming More Prevalent and Sophisticated
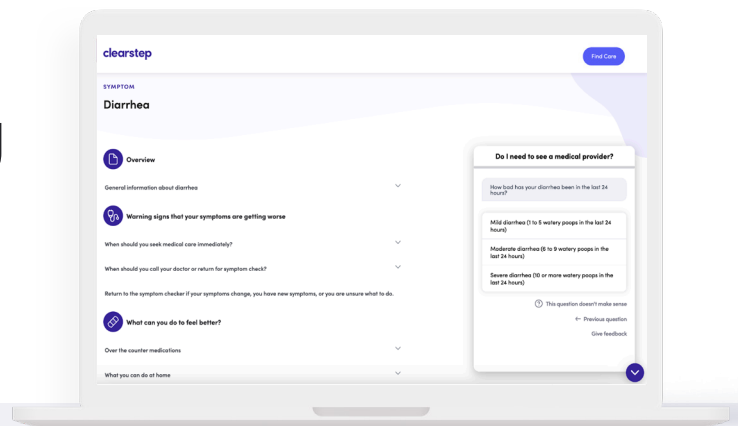
AI-chat assistants have already made significant inroads in the healthcare sector, but in 2024, we can expect these assistants to become even more sophisticated and prevalent.

While some healthcare organizations already use AI chat assistants for routine administrative tasks, their ability to execute more complex tasks such as triage with appointment scheduling, matching patient demand to clinically appropriate, convenient and cost-effective supply, and providing sound medical information and preliminary diagnosis will increase.

This increase in ability is largely due to AI chat assistants using not only advanced natural language processing (NLP) but also leveraging **clinically validated large language models (cLLMs).**

Knowing how to leverage cLLMs safely is the key to unlocking conversational AI assistants' potential, moving away from strictly performing routine tasks, and providing more personalized responses and recommendations, which are ultimately more helpful for organizations and their patients.

# Heightened Regulations

As AI becomes more integrated into healthcare, **ensuring that these AI systems are used safely and ethically** is essential.

In 2024, healthcare regulatory bodies will likely introduce heightened regulations and more in-depth protocols to address the following concerns:

1. **Patient Safety Concerns**
   **Regulatory bodies will focus on ensuring that AI systems meet stringent safety standards and do not introduce new risks to patients.** These new regulations may involve requirements for robust testing, validation, and monitoring of AI algorithms.

2. **Bias and Fairness Mitigation**
   **Addressing bias and ensuring fairness in AI algorithms is a paramount concern.** Regulators may require healthcare organizations to demonstrate that their AI systems do not discriminate against specific patient demographics and are actively mitigating bias in AI training data and algorithms.

3. **Transparency and Explainability**
   **Regulators may require AI systems to be more transparent and explainable in their decision-making processes.** Patients and healthcare providers alike may want insight into why an AI system recommends a particular treatment or diagnosis.
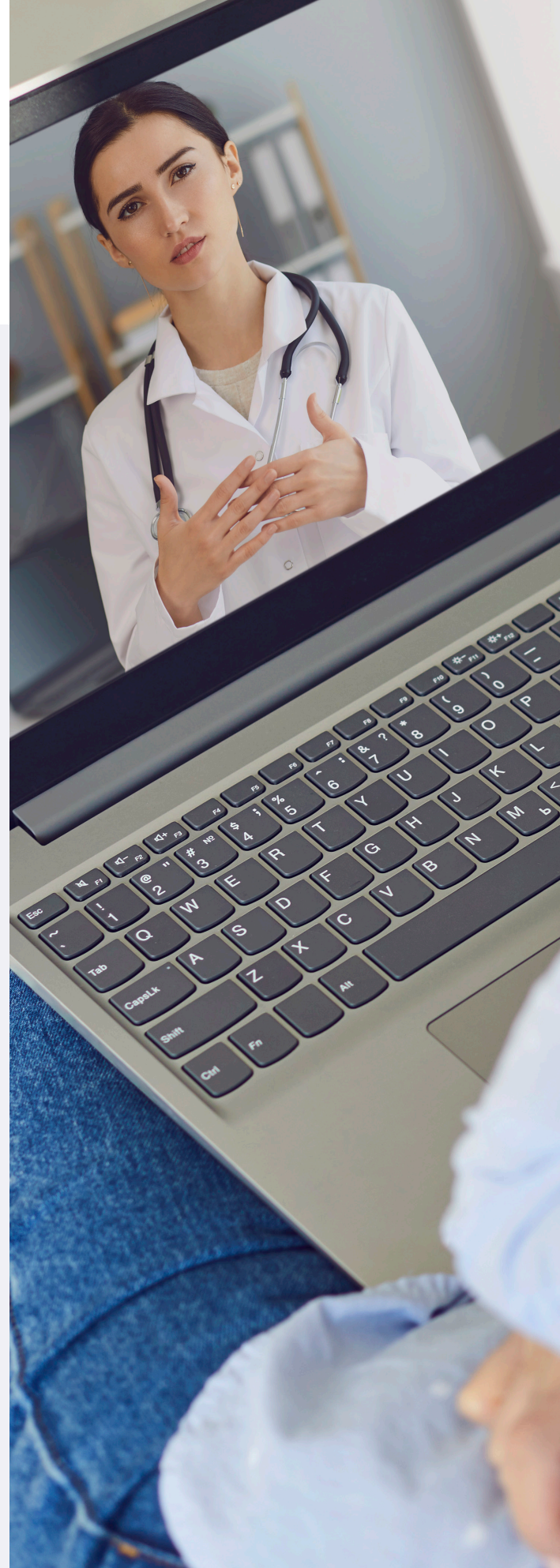
# Using AI to Drive Cost-Effective Care
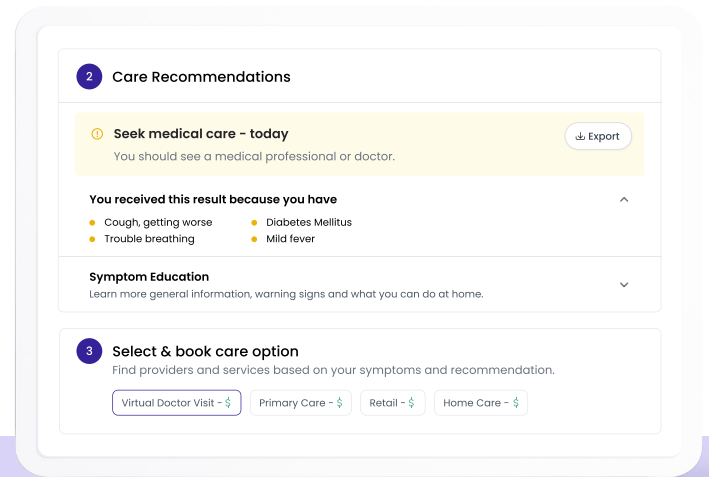
The rising cost of healthcare is a national concern, and **AI offers a promising solution to make healthcare more cost-effective.**

In 2024, healthcare organizations will increasingly leverage AI to provide cost-effective care, reduce waste, and improve service quality.

### Predictive Analytics for Preventive Care

After analyzing patient data, including electronic health records (EHRs), claims data, and social determinants of health, AI algorithms can predict health risks and recommend early interventions to prevent health episodes or hospitalization. Taking this proactive approach to care helps to avoid issues before they escalate and can significantly reduce the overall cost of care.

### Automating Administrative Tasks

AI-powered chatbots and virtual assistants can handle administrative tasks such as appointment scheduling, billing inquiries, and insurance verifications. Automating these processes reduces administrative overhead and can free up staff for more critical patient care activities.

### Personalized Treatment Plans

By considering an individual's medical history, genetics, lifestyle, and preferences, AI algorithms can recommend treatment options that are more likely to be effective. Personalization can reduce trial-and-error treatments and minimize the cost of unnecessary tests or interventions.

### Fraud Detection and Billing Accuracy

By analyzing patterns in claims data, AI algorithms can detect unusual billing behaviors and minimize losses due to fraud. Additionally, AI can help ensure that organizations are billing services correctly, which reduces the chance of costly billing errors.

# Finding a Curated Approach to Implementing AI

Not all AI models are created equally, and to navigate the complexities of AI implementation in 2024 effectively, healthcare organizations need to clearly understand **the different AI models available and curate their approach accordingly.**

There are two dominant types of AI methods used in healthcare: expert systems and computational statistical models (i.e., neural network and non-neural network-based). Which model to use should be driven by an organization's specific needs, the nature of the healthcare intent they aim to address, and the quality of patient care they aspire to deliver.

**Expert Systems**

Expert systems, often referred to as rule-based systems, are AI models that rely on predefined rules and algorithms to process data and provide insights.
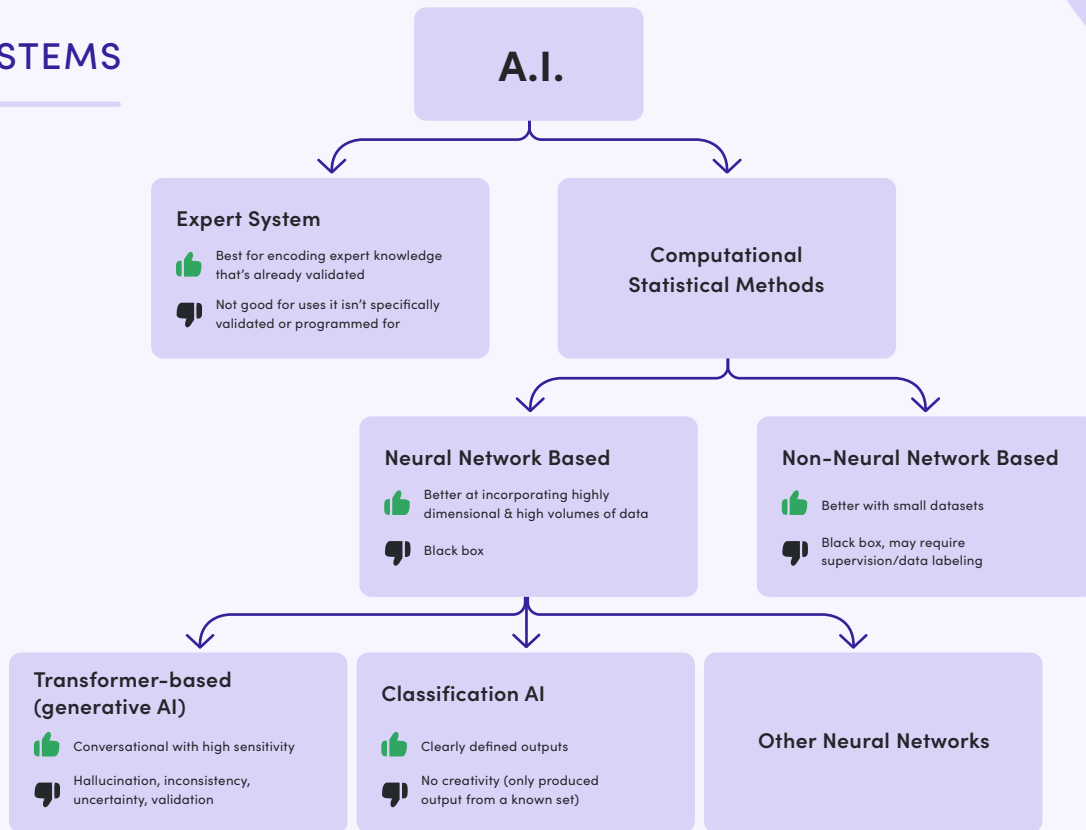
These systems excel at structured tasks and are particularly suitable for decision support of patients and clinicians based on evidence-based guidelines and rules that medicine has uncovered over its millenia. In healthcare, expert systems can be valuable for tasks such as triaging patients, flagging potential drug interactions, or interpreting diagnostic images.

**Computational Statistical Models**

Computational statistical models, on the other hand, include a wide array of neural network and non-neural network based systems. These are models that use probabilistic (rather than deterministic) frameworks to classify, predict, and generate information. Generative AI models are the more recent and dynamic addition to the computational statistical landscape. They are capable of generating content, including text, images, and even diagnoses, based on patterns and data they've learned from large datasets. Computational statistical models include structured and unstructured approaches. Generative models are a subset of computational statistical models that are adept at handling unstructured data, such as free-text clinical notes, and can assist in natural language processing, predictive modeling, and personalized treatment recommendations. They have the potential to uncover hidden insights within vast amounts of healthcare data. However, the optimal approach lies in striking a harmonious balance between expert systems and computational statistical models.

For routine, rule-based tasks that require adherence to established guidelines, expert systems are the trusted choice. In scenarios where the intent is nuanced, and data is unstructured, computational statistical models can unlock new dimensions of patient care, offering tailored recommendations that cater to individual preferences, needs, and contexts.

## A.I.

### Expert System

👍 Best for encoding expert knowledge that's already validated

👎 Not good for uses it isn't specifically validated or programmed for

### Computational Statistical Methods

### Neural Network Based

👍 Better at incorporating highly dimensional & high volumes of data

👎 Black box

### Non-Neural Network Based

👍 Better with small datasets

👎 Black box, may require supervision/data labeling

### Transformer-based (generative AI)

👍 Conversational with high sensitivity

👎 Hallucination, inconsistency, uncertainty, validation

### Classification AI

👍 Clearly defined outputs

👎 No creativity (only produced output from a known set)

### Other Neural Networks

# Harness the Power of AI in 2024

In 2024 and beyond, healthcare organizations will harness AI to become more responsive, adaptive, and effective in meeting the dynamic needs of their patients, staff, and business goals.

As organizations navigate the AI-driven frontier, it is imperative to prioritize ethical AI practices, ensuring that the future of healthcare remains not only technologically advanced but also patient-centric and ethically sound.

The synergy between expert systems and generative AI models will be vital to unlocking the full potential of AI in healthcare. It will enable organizations to deliver high-quality, clinically validated care while focusing on efficiency.

At Clearstep, **our unique AI framework** harnesses the strengths of expert systems and generative AI to power our comprehensive solutions that support patients' varied needs.

If your healthcare organization wants to harness the power of AI, leverage our digital triage and care navigation software to provide safe, ethical, and clinically backed care to your patients. Connect with us at **info@clearstep.health** for more information.