

# THE FUTURE IN HEALTHCARE: IS THE EHR THE BEGINNING OF A BOLD NEW WORLD IN AI?

What comes to mind when you think of AI, or Artificial Intelligence? Perhaps this is a topic you have not spent a lot of time considering, but the creative minds of Hollywood have certainly given it their best shots. From HAL 9000's ominous "I'm sorry, Dave" in Stanley Kubrick's classic 1968 "2001: A Space Odyssey" to Pixar's adorable trash compacting Wall-E forty years later, movie fans have been exposed to visions of artificial intelligence that run the gamut from helpful to malevolent.

**"Artificial intelligence is poised to become a transformational force in healthcare."**

Perhaps "Frankenstein" was the original big screen version of "artificial" intelligence, but the possibility of a robot or machine that is capable of human analysis always seems to pique our curiosity. The android Data amused us on Star Trek: The Next Generation, while Skynet's terminators terrified audiences. IBM's Watson played an impressive game and won a million dollars playing against human champions on TV's Jeopardy, but still managed to make some astounding clunkers when answering questions.

For good or bad, the overriding theme of all these creations is how the interplay between man and machinery will work itself out in the future. Although not fully capable of the nuances of human thinking and emotion, artificial intelligence is growing by leaps and bounds in its capability to quickly analyze data and make a decision. Believe it or not, artificial intelligence is already impacting our daily lives in numerous ways. The supposedly simple task of sorting emails into either a useful or a spam folder is just one example of basic artificial intelligence. The next step is already apparent in the ability to analyze the content of an email message and accurately suggest possible responses.

AI has also insinuated its way into the healthcare industry, perhaps without realizing it as well. In fact, Health IT Analytics predicted that "Artificial intelligence is poised to become a transformational force in healthcare," affecting both providers and patients in profound ways. Everything from radiology, surgery and improving population health to creating a more intuitive interface in the use of the EHR, or Electronic Health Record, is on the table when it comes to incorporating AI into the healthcare continuum.



# WHAT IS ARTIFICIAL INTELLIGENCE, OR AI, AND HOW DOES IT IMPACT EVERYDAY LIFE?

Artificial intelligence, or AI, is different from the natural intelligence inherent in human beings and animals. It is constructed by men to make machines function more effectively and efficiently. These machines mimic certain functions of the human brain such as analysis, learning and problem-solving. Some require the understanding of human language and thought processes in order to take a specified action or posit a solution to a particular problem. Computer programs that play chess or other games are based on AI, and it is also required to instantaneously process the thousands of details required for safe implementation of driverless cars.

Artificial intelligence was originally developed as an analytical tool to take enormous amounts of data and transform it into manageable and meaningful information. This foundational element was built upon with the capability of analyzing past information and experiences, and using that knowledge to make accurate predictions and inform future decisions. The next step in the developmental process is the capability to take actions based on an awareness of the consequences of a particular action and its impact on others.

AI can be used in many industries and is encountered in numerous ways on a personal basis. Spam filters, fitness trackers, ride-sharing apps, language translators, online shopping or entertainment suggestions, pesky plagiarism checkers, and helpful assistants like Siri or Alexa are all examples of how AI is beginning to invade our lives, with or without our explicit knowledge and acceptance.

In business, the AI applications are even more far-reaching. Possible and actual uses include humanoid robots for manual and repetitive tasks, power and transportation grid management, better beer brewing, investment analysis and predictions, delivery routing, facial image recognition, product market targeting, and attempts to weed out potential hate speech on social media sites like Facebook and Twitter.

Whether AI is good or bad is a hotly debated topic. There are proponents who insist it is the best thing since sliced bread and a toaster, and those who are concerned about what happens when the AI network fails or worry whether the dire movie predictions could possibly come true in real life. Even as an intense debate about the future of AI is being waged, there is no doubt that more and more of it is being incorporated into diverse aspects of our lives. Today's narrow applications are sure to spread as the science behind the systems becomes exponentially more advanced. The timeframe for wide-spread implementation, if at all, is still unknown, but it behooves those of us in the healthcare world to be aware of its uses, benefits, applications and limitations.

# APPLICATIONS FOR ARTIFICIAL INTELLIGENCE IN HEALTHCARE

For the healthcare industry, AI could prove to be a game-changer for everyone from the top pharmaceutical companies and hospital chains to the local medical practice. Virtually every aspect of the medical industry can be impacted by artificial intelligence, from robot-assisted surgeries to enhanced EHR performance.

In the research and development end of the medical arena, AI helps to find clinical trial participants and speeds up the development of potentially lifesaving medications. Virtual nursing and workflow assistants are freeing up desperately needed doctor and nurse time in the hands-on hospital environment, while virtual assistants help administrators better manage workflow and weed out fraud and reduce dosage errors.

When looked at in the light of continued pressure from the federal government and insurance companies to provide better-managed healthcare and improved population health at lower costs, AI can be of tremendous benefit in streamlining processes and closing healthcare gaps.

Here are some exciting examples of how artificial intelligence is being incorporated into the healthcare field on a rapidly increasing basis:

## **Streamlining Drug Discoveries**

AI has the ability to vastly decrease the time and effort required from scientists to analyze data, study molecular binding capabilities, and find potential candidates for clinical trials. Substantial progress is being made in such once-unthinkable areas as Ebola and multiple sclerosis.

## **Machine Learning for Better Diagnoses and Faster Treatment**

Pathologists are using enhanced machine learning algorithms to quickly analyze tissue samples and make far more accurate diagnoses based on the available data. Radiologists use AI to classify images more clearly, and offer a more accurate identification of cancer and other conditions. This will facilitate advanced care from the get-go, increase treatment options and improve patient outcomes.

## **Proactive Healthcare Management**

In line with the goal of increasing patient engagement, artificial intelligence can be called upon to help patients better manage their own healthcare. It can be used to search for healthcare gaps, make appropriate recommendations, schedule appointments, manage prescriptions, and monitor testing for conditions such as diabetes and high blood pressure.

## **Better Emergency Room Pre-Screening**

One of the more life-saving applications of AI-powered machines is in the area of detection, diagnosis, and treatment in the emergency room. AI can quickly digest input and prescreen patients for potentially life-threatening conditions so that appropriate measures can be taken by emergency room personnel.

# EXPANDING THE APPLICATIONS OF AI IN EHRs

The move to digitalization of healthcare records is making steady progress, but it has not come without some headaches for medical practitioners. Early EHR versions without advanced intelligence features resulted in endless documentation, difficult usage, and massive time-consumption, leading to stress and user burnout. EHRs now take advantage of artificial intelligence which allows the creation of more intuitive interfaces. Many routine, time-consuming processes are automated to ensure a faster and more accurate documentation process.

- AI is perfectly suited for the three main tasks of Electronic Health Records:
- Documentation of patient visits, notes, test results, and clinical progress.
- Order entry for tests and prescriptions across all care providers, and management of routine appointment and prescription requests from patients.
- Managing patient engagement and self-maintenance progress through patient portals.

This progress is directly related to the increased use of AI to improve voice recognition and medical terminology, which provides a significant improvement in the documentation process. Future growth will allow the EHR to serve as more of a virtual assistant to the medical professional, perhaps even suggesting possible diagnosis and treatment paths. The EHR may also utilize AI to organize physician activities to create a more efficient to-do list that manages patient needs more effectively.

AI is not being left to the imagination of movie makers any longer. It is part of the real world here, now and in the foreseeable future. Healthcare providers from major hospitals to local providers will be investing heavily in AI in the coming years. Beginning with the EHR, Artificial Intelligence is the future of sophisticated healthcare. With care, patience, and understanding it can become an efficient part of the small to medium-size medical practice as well.

