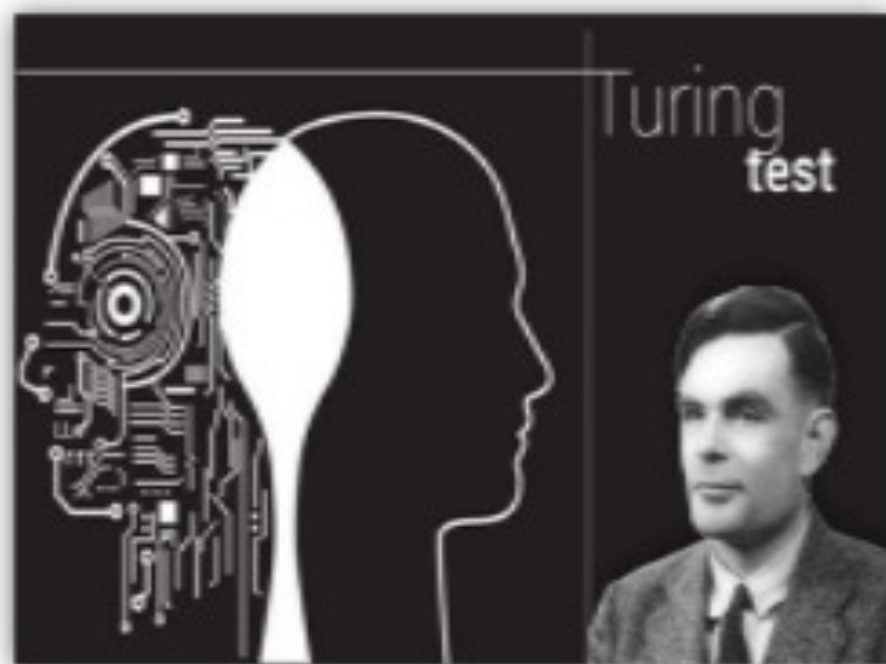




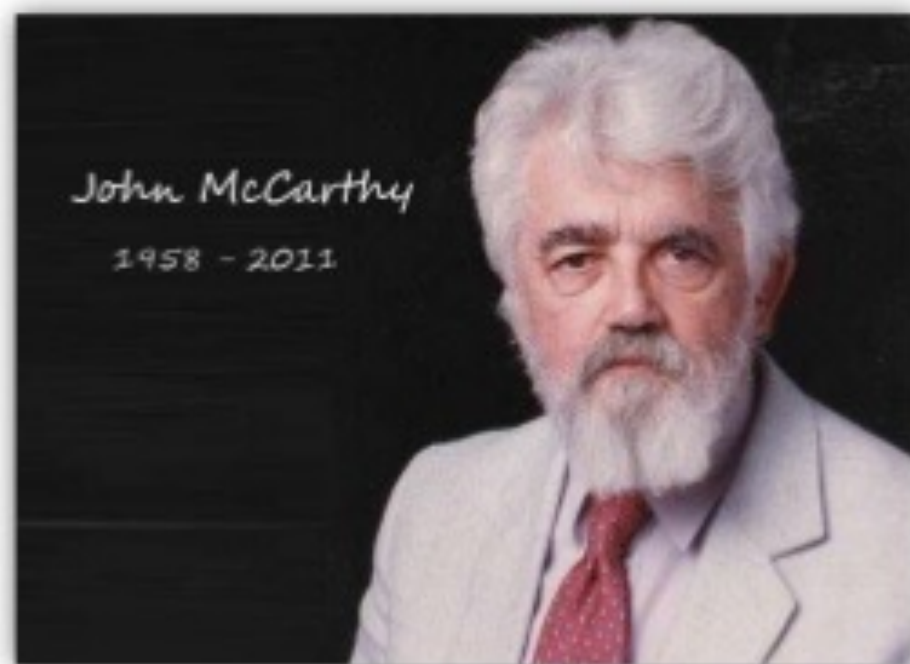
Artificial Intelligence(AI) in Medicine

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EARLY HISTORY OF A.I.



1950 : “CAN MACHINES
THINK???????”



1956 : THE TERM
“ARTIFICIAL INTELLIGENCE”
WAS FIRST INTRODUCED.

Medical Data



Text



Voice



Picture



Video



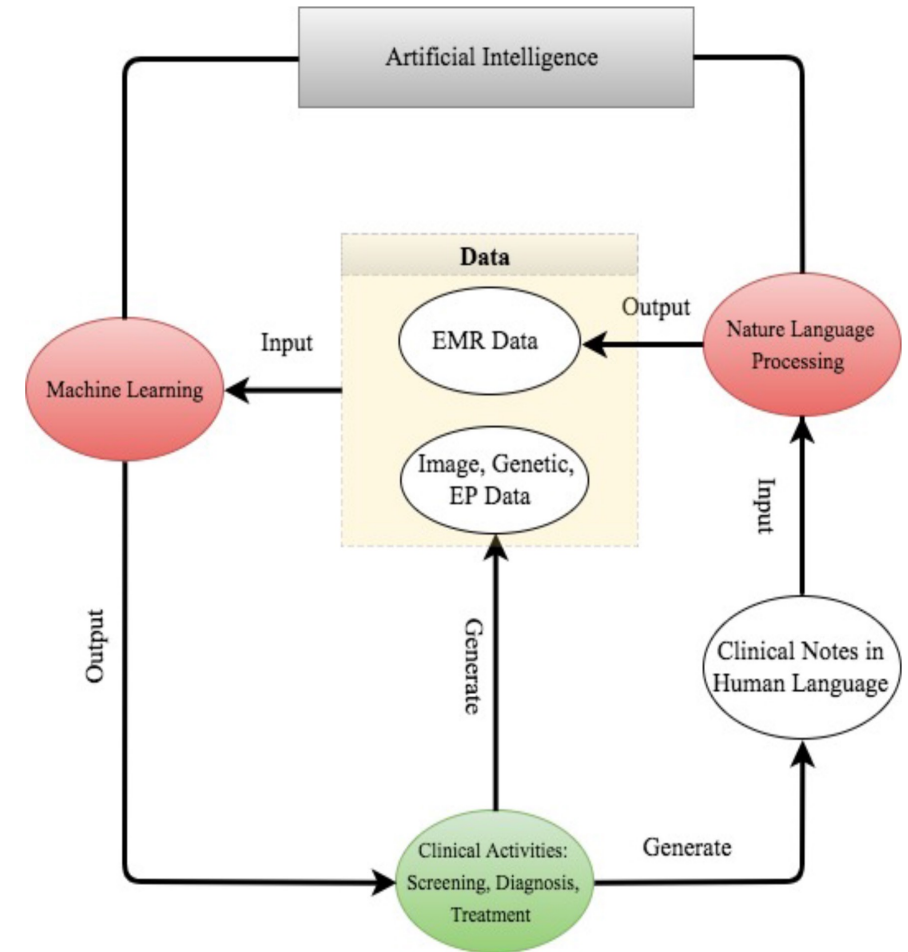
Real time

This is how
we store our
data?



Basics of Data Capture in Medicine

- EMR
- PACS
- Clinical Informatics Department
- Information Technology department
- Change Management



AI Applications in Medicine

Preoperative Planning and Templating

- Interactive digital planning and templating.
- Transitioning from 2D to 3D visualization.

Machine Learning Algorithms

- Beyond conventional computing.
- AI's potential to enhance clinical decision-making.

Medical Diagnosis

- AI systems can analyze far more data far faster than humans, which may make them more adept at identifying medical diagnoses than doctors.
- For example, when a patient with a serious condition receives a diagnosis, friends and family encourage that person "to get a second opinion" since human doctors often interpret medical information differently.
- AI uses historical data from hundreds, thousands, or even millions of diagnoses and then compares that with a patient's condition to diagnose the malady, to predict the progression of the malady and to recommend treatment.



Basic science:Medical technology



3D printing, Navigation, Robotics, are old technologies



Medical Knowledge is doubling every 44 day



Data Science



AI



Precision Medicine

Ongoing areas of study

Predictive
Analysis

Computer
Vision

NLP

Wearable

AI | Ophthalmology

- RETINA-AI , the world's first mobile AI app for eye care , capable of detecting macular edema and subretinal fluid on OCT scans.
- FDA issued the first approval of a diagnostic AI device in medicine, IDx-DR, for use in primary care settings as an automated diabetic retinopathy screening tool.
- And these two developments are just the beginning.



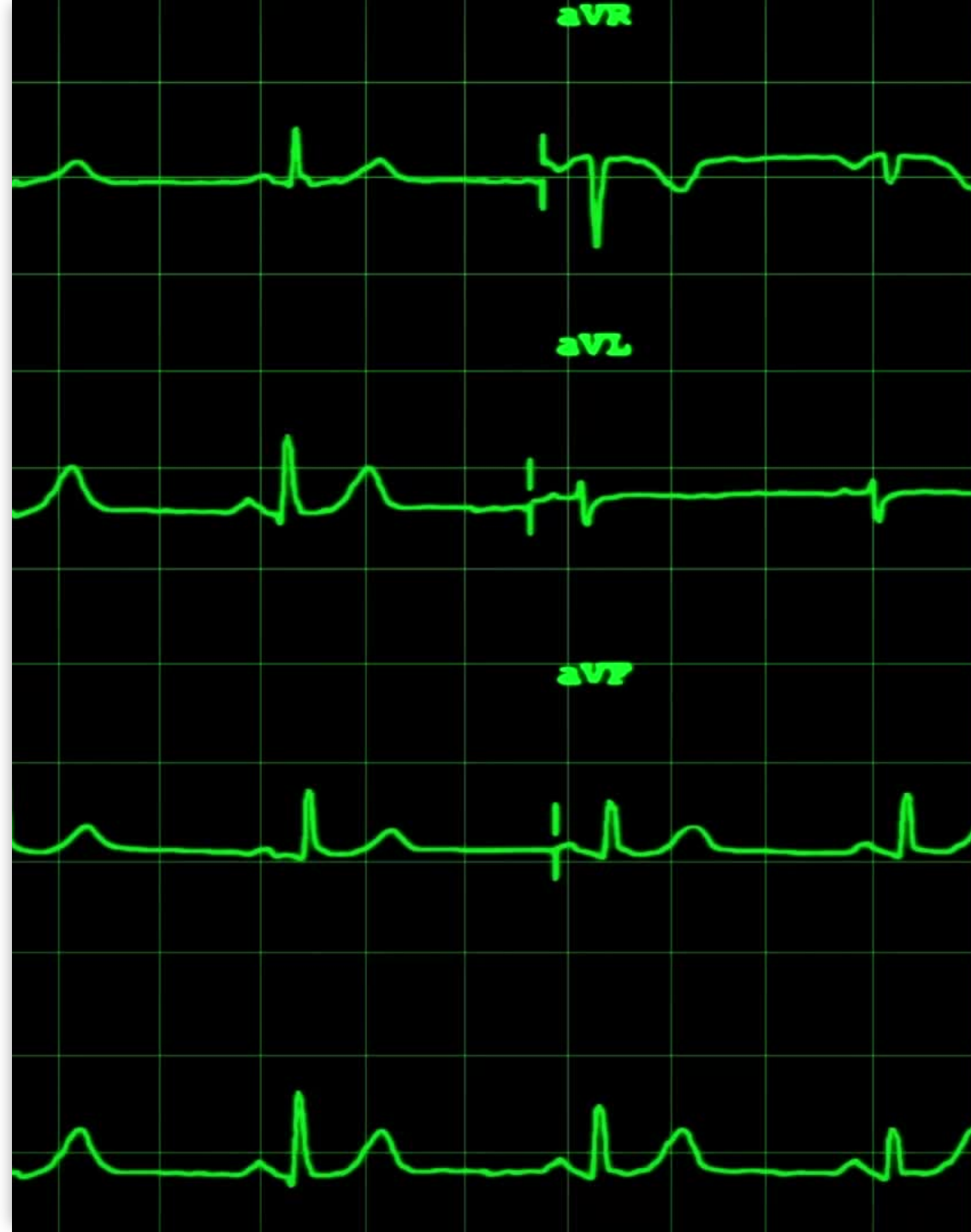
Antibiotic Resistance

- Antibiotics, and their pervasive use is resulting in antibiotics-resistant bacteria that kills 70,000 people per year globally.
- Researchers use [machine learning](#) (an AI technique) to identify genes that cause antibiotic resistance in bacteria.



Cardiology

- An example of AI use is an implantable defibrillator that monitors the heart rhythms of patients at risk of a sudden heart attack.
- The device also administers a shock if necessary.



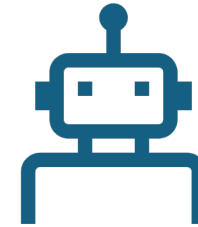
Neurology



Neurological healthcare deals with nervous systems disorders such as Parkinson's disease, Alzheimer's disease, epilepsy, stroke, and multiple sclerosis.



AI can monitor patients with neurological disorders around the clock to see whether the patient's status is improving or declining.



AI can also predict strokes and monitor seizure frequency.

Immunotherapy for Cancer Treatment

- Immunotherapy for cancer is not an exact science.
- While many immunotherapy options are available, a patient's DNA determines whether the treatment will be effective.
- Since AI can analyze far more information far faster than humans, it's capable of recognizing patterns in genetics strings and correlating those against immunotherapy options.
- The capability could result in a truly personalized approach to cancer treatment.



Pathology Images



Most diagnoses depend on a pathology result, so a pathology report's accuracy can make the difference between diagnosis and misdiagnosis.



AI can "see" pathology results at the pixel level which can indicate the progression of cancer, for example.



AI also helps humans focus on the most relevant area of a pathology image.

Radiology Tools

- Various forms of radiology, such as CT scans, MRIs and X-rays provide healthcare providers with an inside view of a patient's body.
- However, different radiology experts and doctors tend to interpret such images differently.
- AI helps enable more consistent interpretations.
- It also helps radiologists better identify the status of a tumor or the aggressiveness of a cancer.



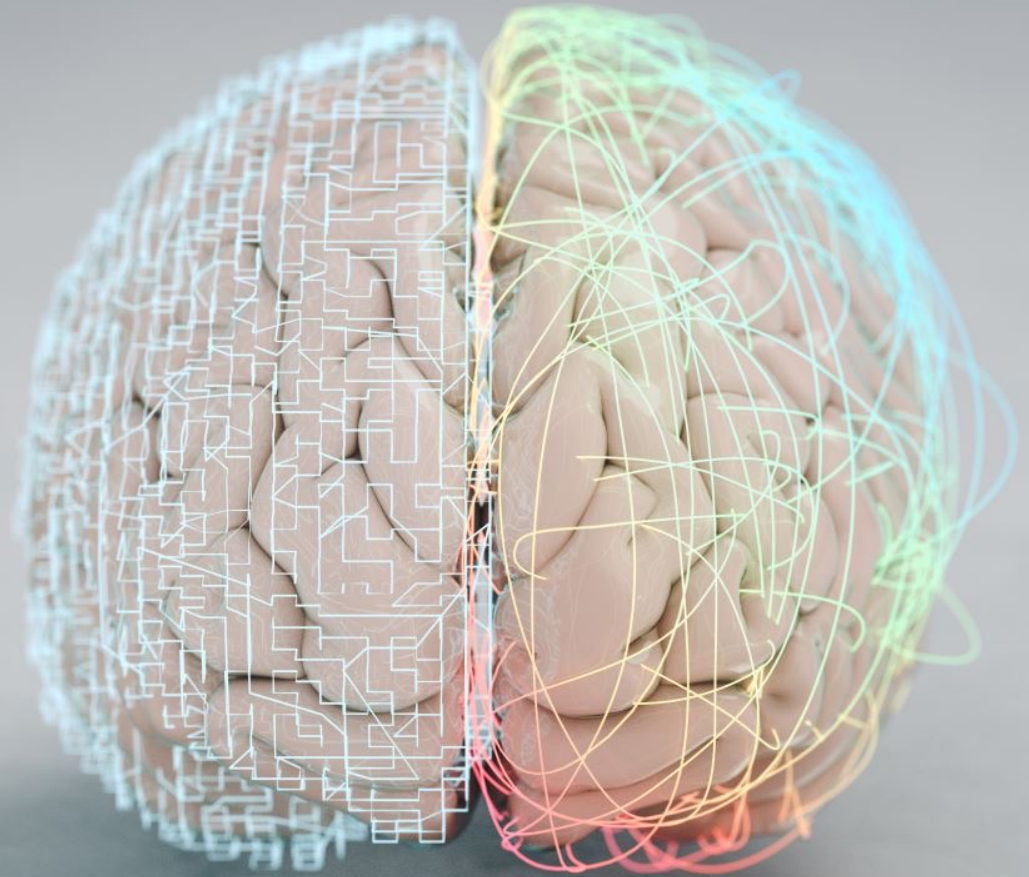
Surgery

AI is used in operating rooms in an assistive capacity to narrow the considerable variance between the experience and knowledge of various doctors.

An AI-enabled system is able to comb through vast amounts of data quickly to surface the information the doctor requires.

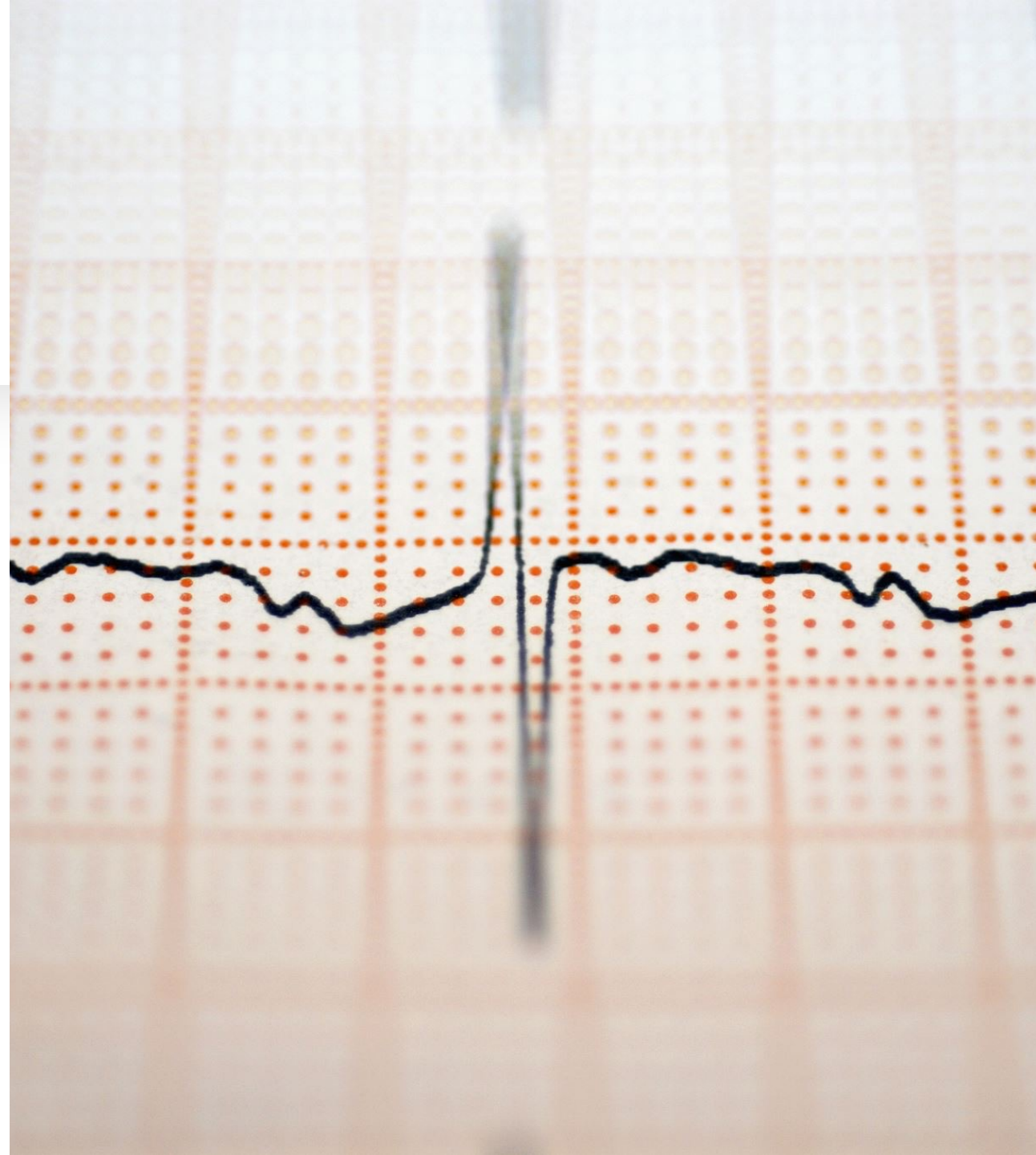
Brain-Computer Interfaces: Disability

- Brain-computer interfaces are not a mainstream technology yet. However, there is a lot of interest in this area because brain-computer interfaces can replace other types of computer interfaces, which is particularly helpful for people with permanent or temporary disabilities.
- For example, AI-enabled brain-computer interfaces can help stroke patients communicate with healthcare providers soon after a stroke rather than after rehabilitative therapy.



Cardiology

- An example of AI use is an implantable defibrillator that monitors the heart rhythms of patients at risk of a sudden heart attack.
- The device also administers a shock if necessary.
- Over the longer term, data from wearables and implantables will be combined with Electronic Healthcare Records (EHRs) for continuous patient monitoring so doctors have more current information about their patients.



The Most Important AI in Healthcare Statistics

The AI in healthcare market is estimated to grow to \$187.95 billion by 2030.

A fifth of healthcare organizations have already adopted some form of AI.

AI could reduce the cost of discovering new drugs by 70%.

Predictive AI tools could reduce hospital admissions by half.

Clinical trials are the most common use of AI in healthcare.

Adoption of AI in healthcare could save between 5% and 10% in US spending.

96% of healthcare executives believe AI is important for health equity.

AI models can predict cancer patient survival with 80% accuracy.

AI can rule out suspected heart attacks twice as fast as humans.

Oncology and Neurology will dominate AI-based precision medicine.

Patients' attitudes towards AI

60% of Americans are uncomfortable with their provider relying on AI.

60% of Americans also believe AI will not improve health outcomes.

75% of Americans believe AI in healthcare will be implemented too quickly.

AI and Clinical Documentation



The technology allows doctors to record conversations with patients to automatically turn them into clinical notes and summaries using AI.



Companies like Microsoft's Nuance Communications, Abridge and Suki believe their solutions will help reduce doctor's administrative workload and prioritize connections with patient

Race For AI

DGX: First supe computer
sold to Elon Musk

Devin: Autonomous AI tool
developed by Cognition

Blackwell beast: AI chip
most powerful

STARGATE: Microsoft and
Open AI supe computer

Conclusion

AI applications in consist of a collection of technologies that will enable machines to sense, comprehend, predict, act, and learn.

The first application for AI-based machines, as discussed at the World Medical Innovation Forum (held in April 2018), is to execute healthcare administrator and clinical healthcare functions.

Current technologies are limited because they are algorithm based. The future of AI will make the leap past algorithm-only tools to become indispensable instruments for patients, providers, physicians, and payers.