



Coker

GROUP

Business Advisors for the Healthcare Industry

How Artificial Intelligence (AI) is Transforming Healthcare



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Intelligence



Artificial Intelligence

AI
Machine Learning
Deep Learning



A Brief History of AI



AI in Health Care (Operations, Collections & Management)



The Ethics and Legal Considerations of AI



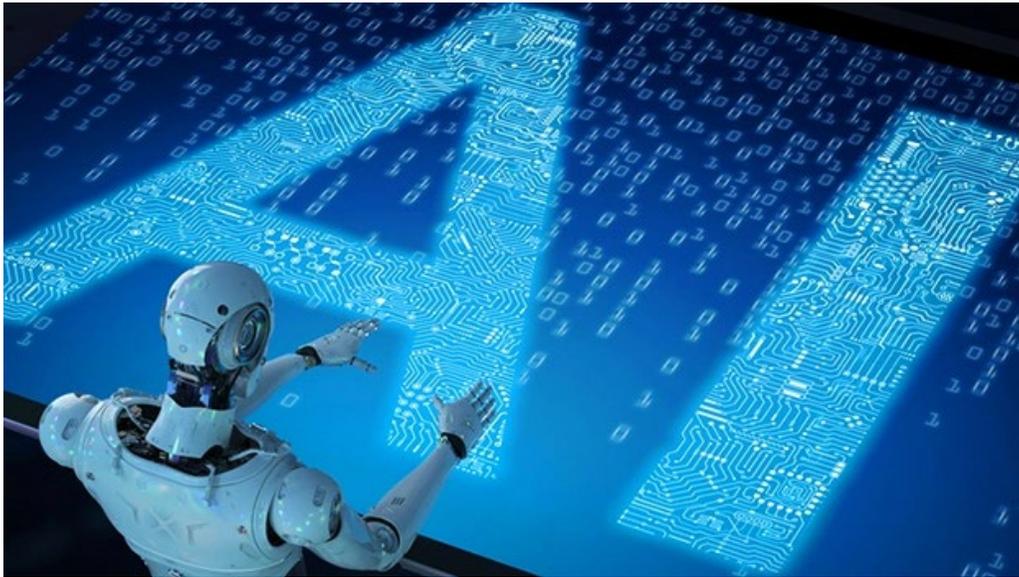
Adopting and Implementing AI

What is Intelligence?



- The ability to acquire and apply knowledge and skills
- The ability to interact (speech, vision, motion, manipulation)
- The ability to reason
- The ability to learn and adapt
- To think abstractly as measured by objective criteria (Ex: test taking)

Types of Artificial Intelligence

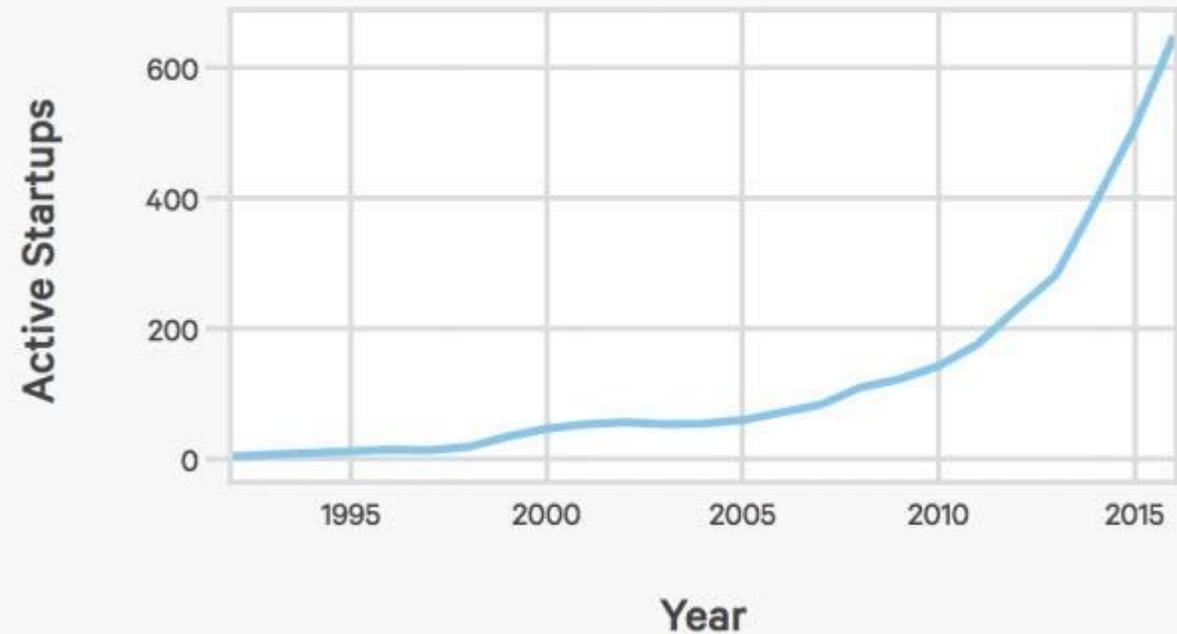


- **Artificial Intelligence** - An umbrella term for machines capable of perception, logic and learning
- **Machine Learning** - Employs algorithms that learn from data to make predictions or decisions, whose performance improves when exposed to more data over time
- **Deep Learning** - Uses many-layered neural networks to build algorithms that find the best way to perform a task on their own based on vast sets of Data

AI by the Numbers..

- Start-ups developing AI grew by 14x since 2000

Startups Developing AI Systems



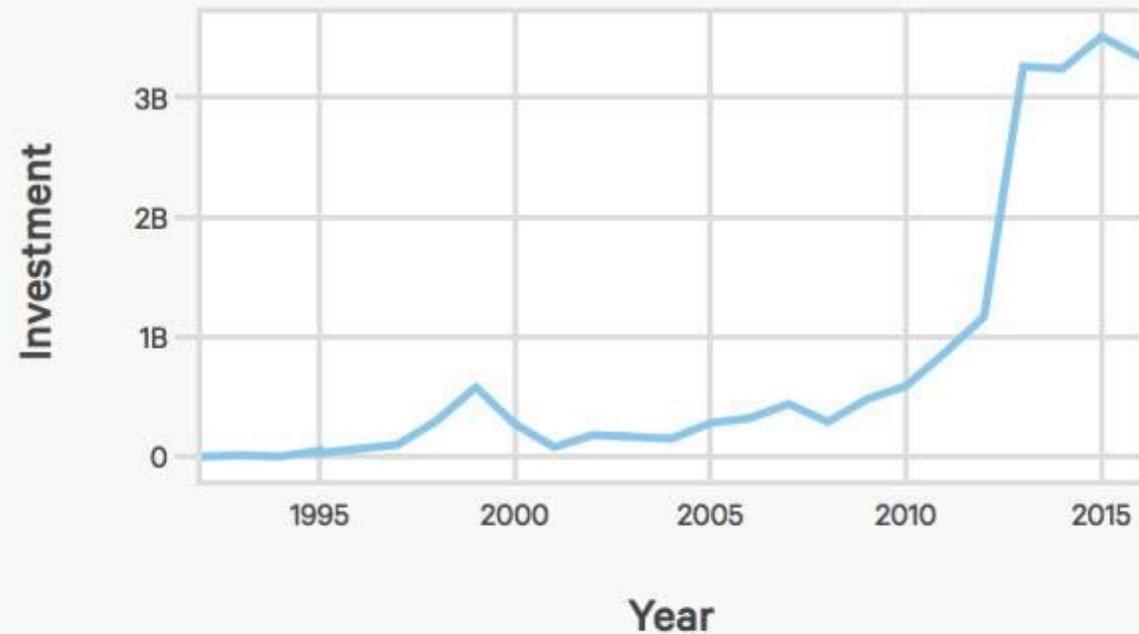
Sources: Crunchbase, VentureSource, Sand Hill Econometrics

AIINDEX.ORG 

AI by the Numbers

- There have been a 6X increase in the annual investment levels by venture capital (VC) investors into U.S.-based AI startups since 2000

Annual VC Investment in AI Startups

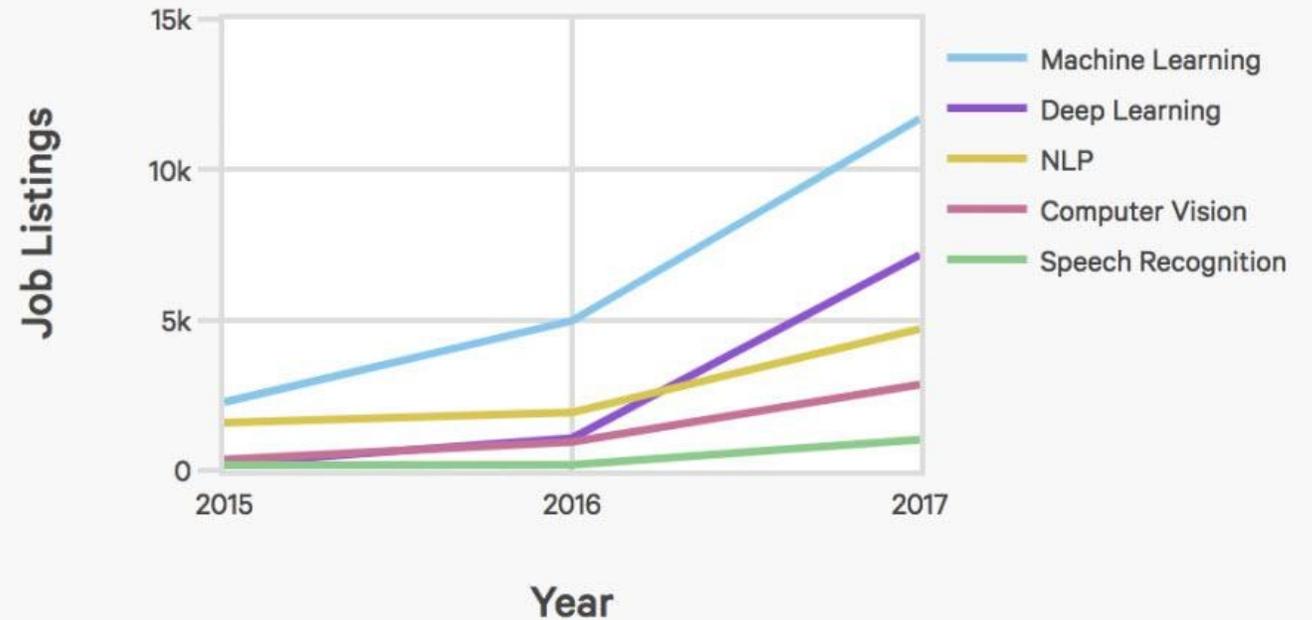


Sources: Crunchbase, VentureSource, Sand Hill Econometrics

AI by the Numbers

- Machine Learning, Deep Learning and Natural Language Processing (NLP) are the three most in-demand skills on Monster.com.
- Median starting salary is: \$127,000

Job Openings, Skills Breakdown (Monster.com)



Source: Monster.com

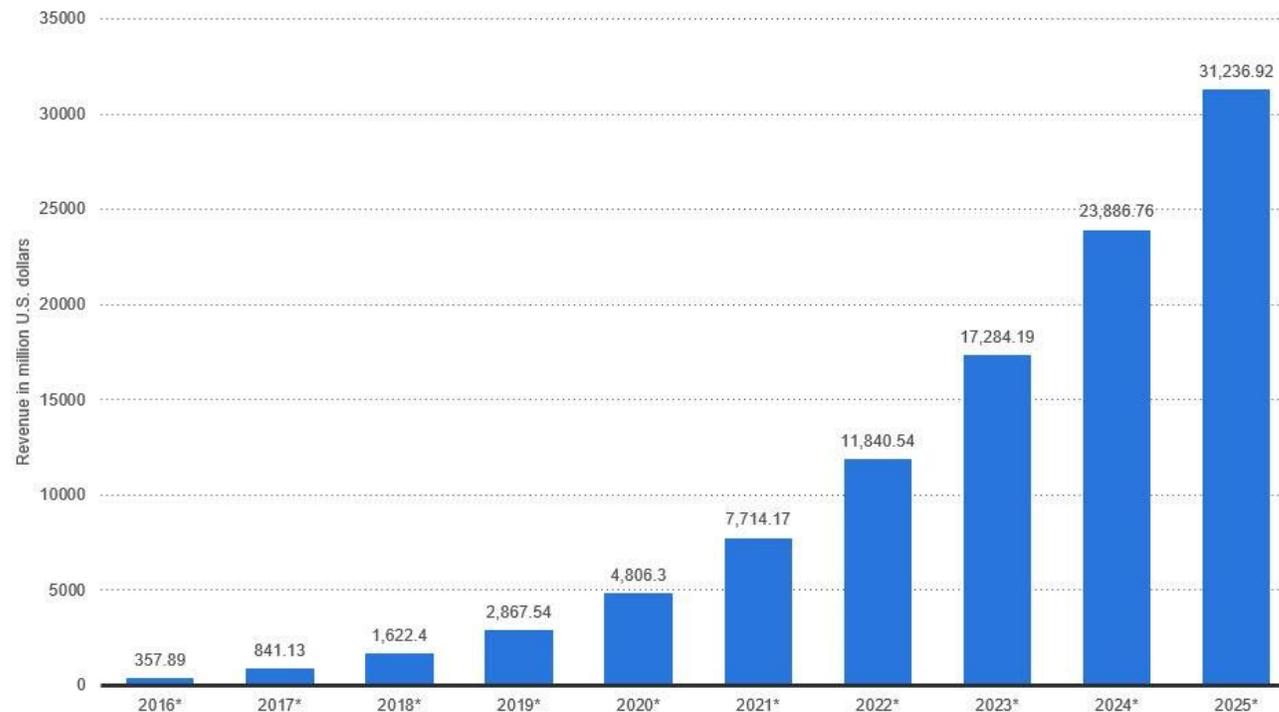
AI by the Numbers...

- Global revenues from AI for enterprise applications is projected to grow from \$1.62B in 2018 to \$31.2B in 2025.
- Image recognition and tagging, patient data processing, localization and mapping, predictive maintenance, use of algorithms and machine learning to predict and thwart security threats, intelligent recruitment, and HR systems are a few of the many enterprise application use cases predicted to fuel the projected rapid growth of AI in the enterprise.

Source: Statista.

Enterprise artificial intelligence market revenue worldwide 2016-2025

Revenues from the artificial intelligence for enterprise applications market worldwide, from 2016 to 2025 (in million U.S. dollars)



Prediction: In 15 years, AI Could Replace 40% of all Jobs

(Repetitive Jobs Most at Risk)



AI Expert Says Automation Could Replace 40% of Jobs in 15 Years

Fortune - Jan 10, 2019

Speaking to CBS News' Scott Pelley in an interview for 60 Minutes on Sunday, Kai Fu Lee said that he believes **40%** of the world's **jobs** will be ...



AI could do 40% of the world's jobs in 15 years

Innovation Enterprise - Jan 11, 2019

"AI will increasingly **replace** repetitive **jobs**, not just for blue-collar work, but a lot of white-collar work," said Lee, a pioneer in AI and venture ...



The Future Of Recruiting In The Age of Automation And Artificial ...

Forbes - Jan 4, 2019

So, the fear of **job** loss in the age of automation and AI is real. ... That reporting also revealed that **40%** of mortgage specialists at a major ... Also, AI programs are already **replacing** human recruiters at initial **job** interviews for ...



20% of millennials in debt expect to die without paying it off

Axios - Jan 9, 2019

40% of the world's **jobs** could be done by machines as soon as 15 ... What he's saying: "AI will increasingly **replace** repetitive **jobs**, not just for ...

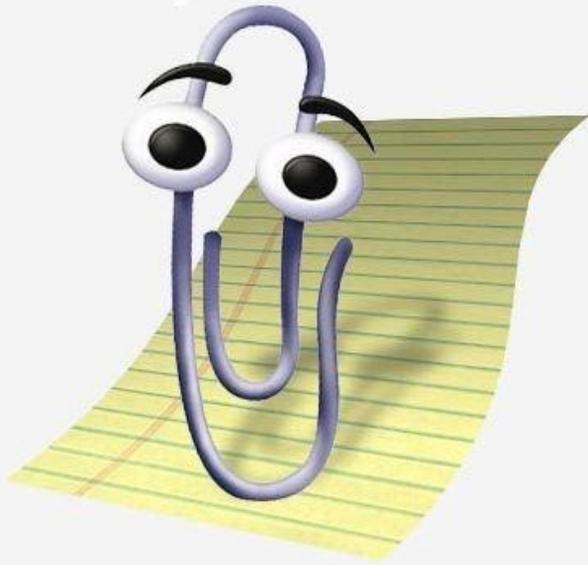


Is Artificial Intelligence about Taking Human Jobs or Creating Them ...

1redDrop - Jan 13, 2019

Is **Artificial Intelligence** about Taking Human **Jobs** or Creating Them? ... CBS News that he thinks about **40%** of all human **jobs** in existence today will be ... A light switch might cost you a few bucks to **replace**, but a smart switch ...

Timeline of AI



TIMELINE OF AI MILESTONES

→
1956

The first Dartmouth College summer AI conference is organised by John McCarthy, Marvin Minsky, Nathan Rochester of IBM and Claude Shannon

←
1965

Joseph Weizenbaum (MIT) builds ELIZA, an interactive program that carries on a dialogue in English language on any topic

→
1978

Herbert A. Simon wins the Nobel Prize in Economics for his theory of bounded rationality, one of the cornerstones of AI known as "satisficing"

←
1993

Vernor Vinge publishes The Coming Technological Singularity, predicting that, within the next 30 years, humankind would have the ability to create "superhuman intelligence"

→
1997

The Deep Blue chess machine (IBM) defeats the (then) world chess champion, Garry Kasparov

←
2009

Google builds self-driving car

→
2011

IBM's Watson computer defeated television game show Jeopardy! champions Rutter and Jennings

←
2016

Google DeepMind's AlphaGo defeats 3x European Go champion Fan Hui by 5 games to 0

→
2017

Google's AlphaGo Zero – an improved version of AlphaGo – learns by playing only against itself and beat its predecessor 89:11 after only 40 days

Sources: Wikipedia, Old Mutual Investment Group

- 75% of all things recommended on Netflix comes from collaboration sourcing. (Source: Statwolf)
- By 2020, 85% of customer interactions will be handled without a human. (Source: Gartner)
- The Washington Post's AI writer (Heliograf) wrote more than 850 stories during the Rio Olympics and the 2016 US presidential election. (Source: Washington Post)
- By 2020, AI will eliminate 1.8 million jobs and create 2.3 million. (Source: Gartner)
- Execs expect AI personal assistants (31%) and data analysis (29%) to make the biggest impact on their businesses. (Source: PWC)
- 44% of consumers don't even realize they're already using AI platforms. (Source: Pega)
- By 2020, 90% of cars will be connected to the internet. (Source: LinkLab)
- Investment in AI will increase more than 300% over the next year. (Source: Forbes)
- 40% of adults now use voice search at least once per day. (Source: Location World)
- 4 billion devices will carry AI-powered voice assistants this year. (Source: HIS Markit)
- AI could prevent 86% of cyber attacks and security threats
- Smart speakers are the world's fastest-growing technology segment (Source: TechCrunch)



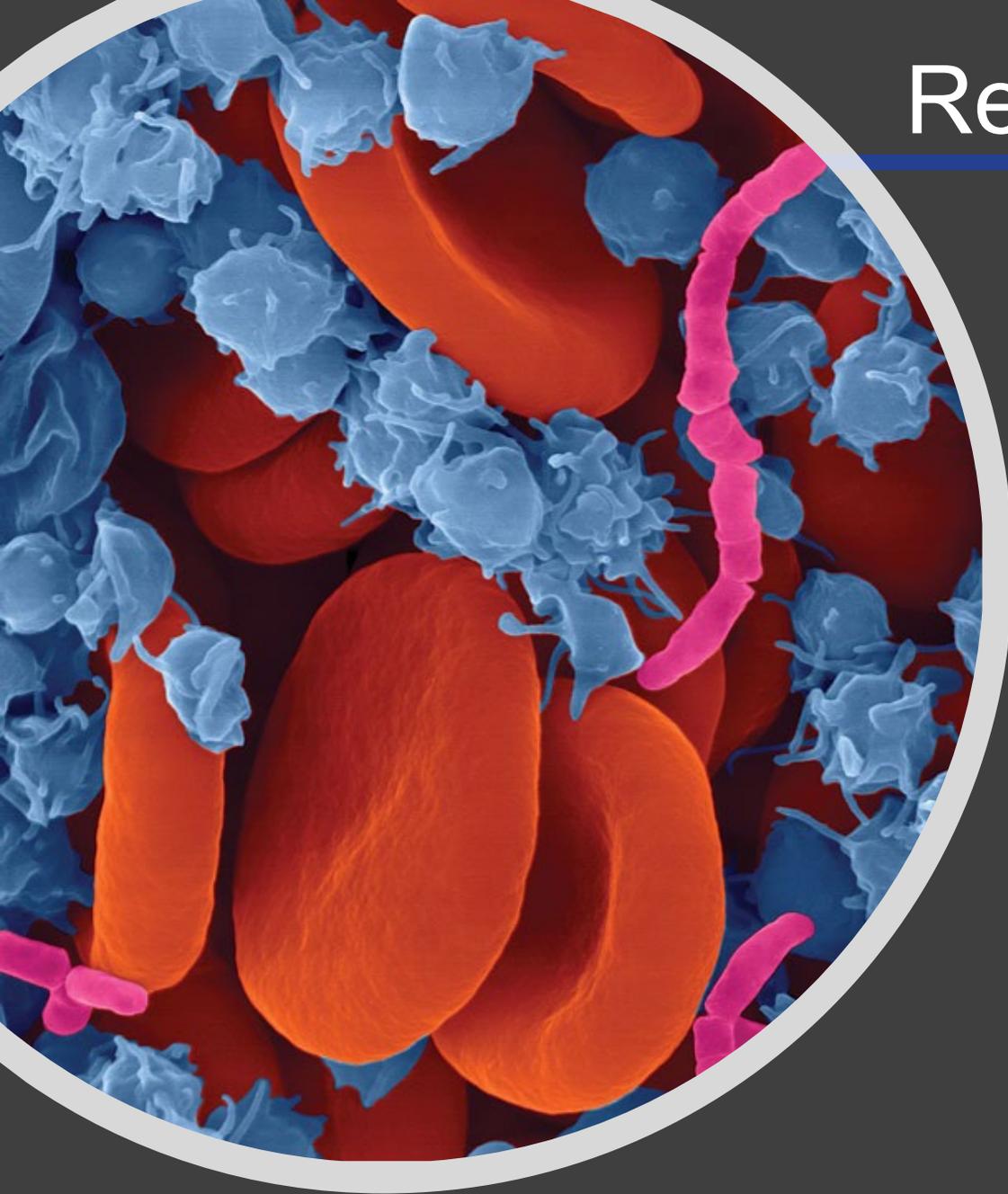
AI IN HEALTH CARE

AI in Health Care

- **Technological developments are a key driver in changing the face of healthcare. But how far are patients prepared to take this. For example, can robots really be used to deliver procedures and how do patients feel about this?**



Reducing Infections



Fighting Infections:

Duke University Hospital, in Durham, N.C., is officially launching Sepsis Watch, an AI-based system that identifies incipient sepsis cases and raises the alarm

How it Works:

Sepsis Watch was trained via deep learning to identify cases based on dozens of variables, including vital signs, lab test results, and medical histories; its training data consisted of 50,000 patient records including more than 32 million data points. In operation, it pulls information from patients' medical records every 5 minutes to evaluate their conditions, offering intensive real-time analysis that human doctors can't provide. If the AI system determines that a patient meets its criteria for someone with the early signs of sepsis, it alerts the nurses on the hospital's rapid response team.

Over 200,000 patients die every year from sepsis

Cost to our system: 27 Billion!

AI Enforced Hygiene



A CDC-funded study underway at Emory University Hospital Midtown (EUHM) and Emory Johns Creek Hospital (EJCH), are testing an AI monitoring system to measure hand hygiene compliance.

How it works:

Data is collected by electronic sensors attached to alcohol hand-rub and soap dispensers in patient rooms and hallways. These sensors know when a caregiver entered into a patient care area and will alarm if they exit the area without washing their hands and/or if they enter an area not having washed hands from leave the prior area.