

FORTUNE KOREA

DAC

Digitization, Automation, Cross-Industry Collaboration

Analysis of AI Adoption in the U.S. Healthcare Industry — Crossing the Chasm into Mainstream Market Sales

Medical AI Roundtable Discussion with Early Adopters



EXPERT

We are transitioning from the Fourth Industrial Revolution, an era characterized by the blurring of lines between digital, biological, and physical innovations, into the Fifth Industrial Revolution, with the rapid evolution of cognitive machine learning causing a massive shift in how humans interact with technology.

Among the array of transformative technologies fueling this revolution, AI stands out as one of the most disruptive technologies on the market. AI's global market size is projected to reach \$184B by the end of 2024. The largest market size will be in the U.S., accounting for \$50.16B. The U.S. is projected to increase this 4x by 2030 (\$223.7B total).

AI is transforming how every industry operates, with healthcare leading adoption at 15.7%. Use cases span administrative, financial, operational, research and clinical areas.

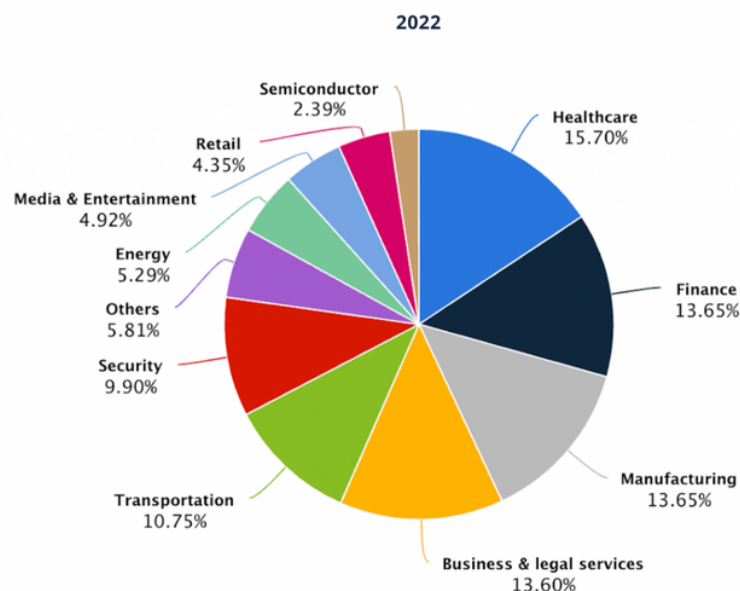
In this issue, we explore current adoption trends in one of the largest AI markets: the U.S. healthcare industry. We provide insights into crossing the adoption chasm, the importance of engaging with leading medical providers and researchers (also known as Key Opinion Leaders, or KOLs) in mainstream market penetration, and critical success factors from stakeholders who have already started integrating AI into their healthcare practice or daily workflow.

Healthcare Leads in Terms of AI Adoption by Industry

Source: [statista.com](https://www.statista.com)

MARKET SIZE SHARE BY INDUSTRY

in percent



Most recent update: Mar 2024

EXPERT

How has the U.S. achieved its status as the global market leader for AI?

Since launching the National Artificial Intelligence Initiative Act of 2020, the U.S. has made significant strides to grow the sphere through investments and global collaborations.

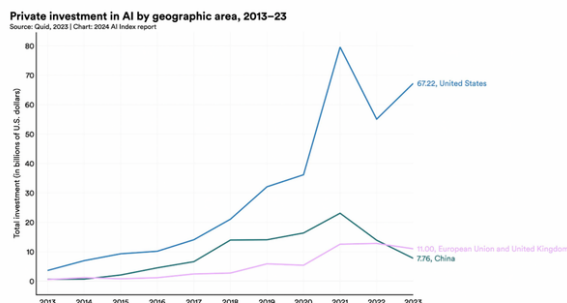
"A global technology revolution is now underway. The world's leading powers are racing to develop and deploy new technologies like artificial intelligence and quantum computing that could shape everything about our lives – from where we get energy, to how we do our jobs, to how wars are fought."

- Antony J. Blinken, Secretary of State.

The U.S. leads AI investments, with \$67.22B compared to \$11B by the European Union and the United Kingdom. **Since 2022, the U.S. has seen a notable increase of 22.1% while other markets are experiencing declines.**

U.S. Leads Global AI Investments, Reaching \$67.22B in 2023

Source: aiindex.stanford.edu



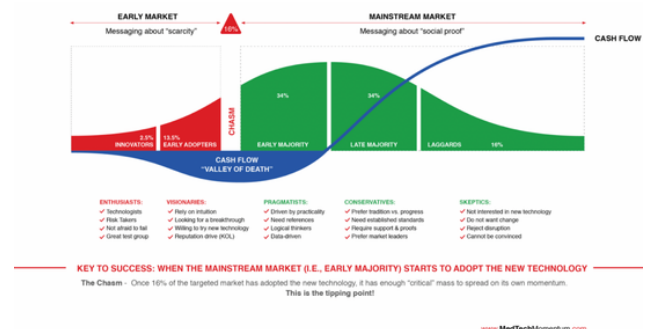
The U.S. also seeks AI collaborations with technologically advanced countries like South Korea. In April, the two nations launched a bilateral working group focused on AI to accelerate technology collaborations. The joint venture aims to strengthen collaborations and promote joint research efforts. The launch of this group signifies a notable milestone in the technological alliance between S. Korea and the U.S.

S. Korean AI innovators with cutting-edge AI solutions may think they are ready to sell in the U.S. based on this growing momentum. They may need to think again.

AI is still very much in its infancy. As such, we leverage Geoffrey Moore's chasm framework to analyze the varying stages of market readiness for the adoption of AI technologies.

Crossing the Chasm - Analysis of Adoption Curve for New MedTech Offerings

Source: themedtechdigest.com



See next page for enlarged graphics.

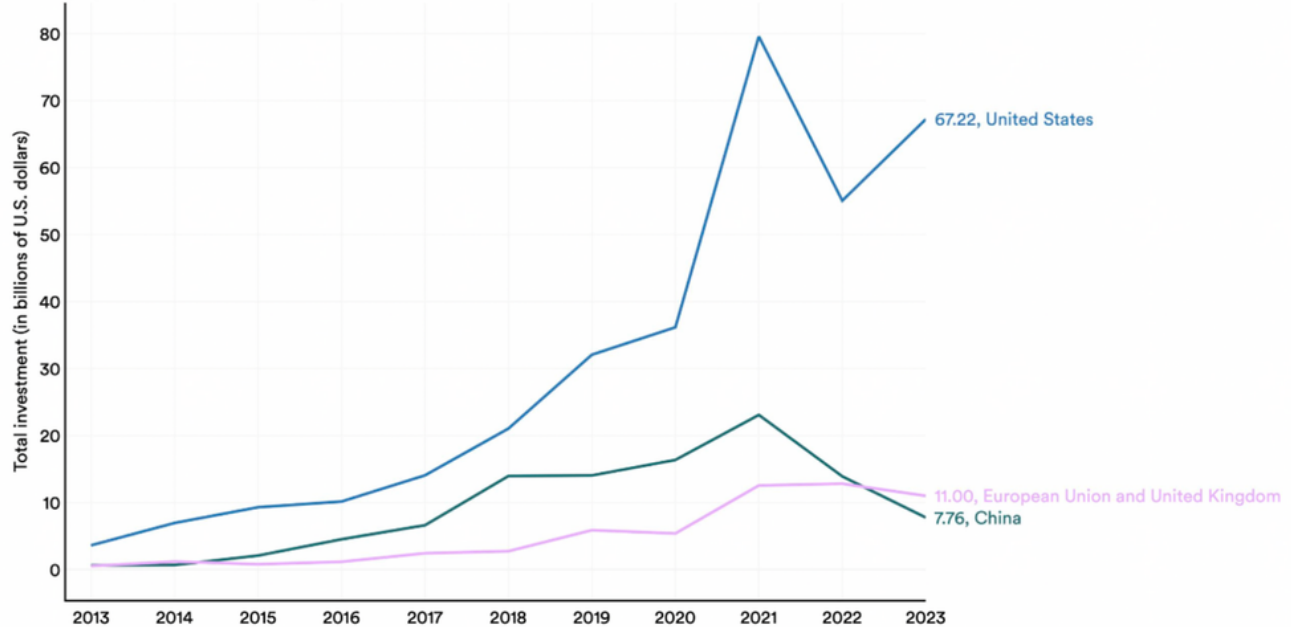
EXPERT

U.S. Leads Global AI Investments, Reaching \$67.22B in 2023

Source: aiindex.stanford.edu

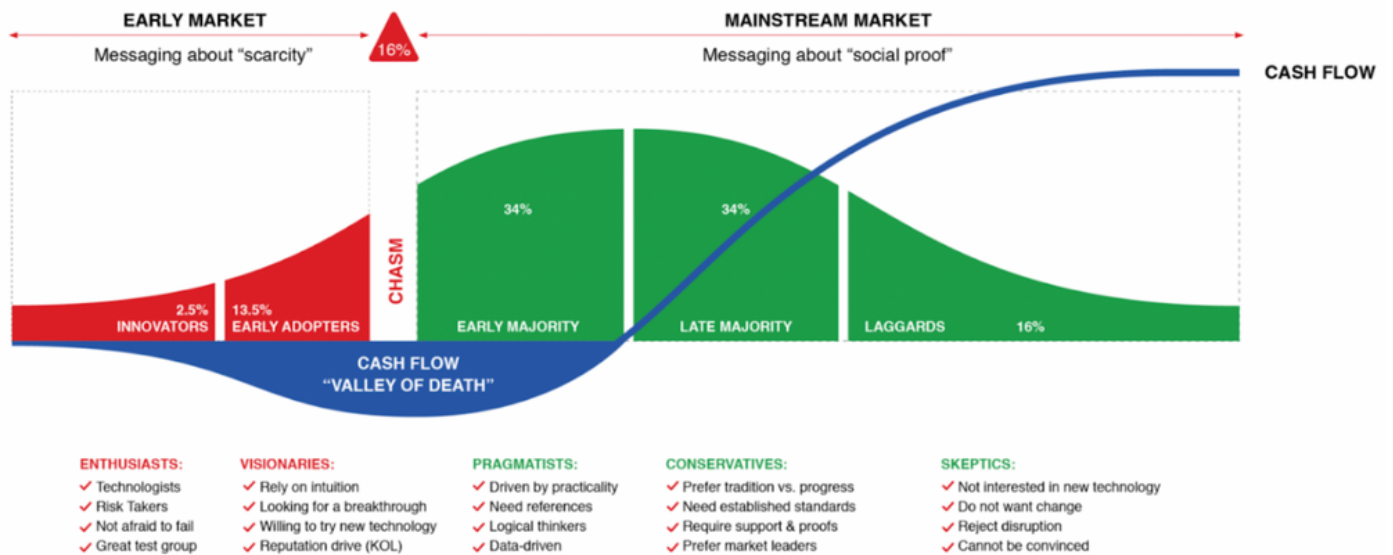
Private investment in AI by geographic area, 2013–23

Source: Quid, 2023 | Chart: 2024 AI Index report



Crossing the Chasm - Analysis of Adoption Curve for New MedTech Offerings

Source: themedtechdigest.com



KEY TO SUCCESS: WHEN THE MAINSTREAM MARKET (I.E., EARLY MAJORITY) STARTS TO ADOPT THE NEW TECHNOLOGY

The Chasm - Once 16% of the targeted market has adopted the new technology, it has enough "critical" mass to spread on its own momentum.

This is the tipping point!

EXPERT

Moore's framework makes the case that high-tech products, especially new, disruptive innovations, **require marketing strategies that differ from other industries.**

As innovators attempt to expand their sales to mainstream consumers who lack specialized technical knowledge, a market-driven approach becomes essential to demonstrate value. **However, it is often the most critical component missed.** Moore notes that this pattern is particularly pertinent to high-tech products. The drop-off point between the early and mainstream market is known as the chasm.

Why do most medical innovators fail when expanding sales to the mainstream market? How can innovators successfully cross the chasm to establish sales longevity for healthcare AI?

A one-size-fits-all technology-driven approach cannot be used for disruptive innovations like AI. Many innovators leverage the same strategies when transitioning from targeting early adopters to the early market majority, resulting in failure.

Each segment has different motivations to try new technology (as demonstrated above) and, therefore, requires differentiated approaches for messaging touchpoints.

How can S. Korean AI innovators generate the social proof needed for mainstream success?

Recruit and develop relationships with U.S. Key Opinion Leaders (KOLs) who already have the established credibility and references that are required to sell in the U.S. market.

In healthcare, KOLs are direct field experts who can work with innovators to bridge critical gaps for market expansion. They have extensive knowledge and experience in their fields and provide valuable opinions on drugs, treatments, and other healthcare products.

KOLs also share first-hand insights into patient experiences, operational pain points, the adoption process within their respective organizations, and more.

KOL relationships are critical in healthcare, not optional.

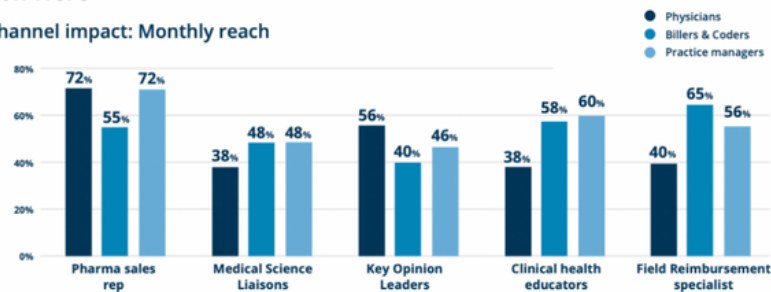
A survey of U.S. physicians, practice managers, billers, and coders found that **KOLs have the highest influence on physician adoption. 67%** of physicians identified KOLs as primary influencers, whereas only **31%** mentioned the company sales team as an influencer.

Although Sales Reps Have the Highest Reach, KOLs have the Most Influence on Physician Adoption

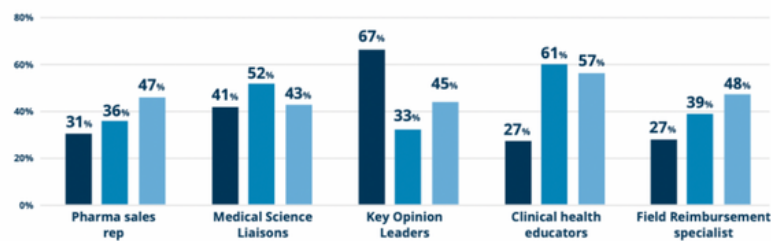
Source: rxvantage.com

Besides sales reps, physicians find KOLs most impactful; clinical educators and reimbursement specialists have a higher impact for non-HCPs

Channel impact: Monthly reach



Channel impact: Influence^a



While physicians frequently meet with sales representatives from MedTech and pharmaceutical companies, discussions with KOLs are considered to be the most impactful.

Why? KOLs have pre-existing market credibility. Partnering with KOLs enables a degree of trust to be transferred to a new innovation in turn.

Engaging the right KOLs for healthcare AI adoption is essential. It is important to understand the role of KOLs at various stages of market expansion.

- **Pre-Market Expansion:** Healthcare KOLs can be reached out to and engaged in the early stages before a product is ready or approved for market expansion.

In this stage, KOLs can provide direct insights on unmet market needs, tips for selecting the right go-to-market targets, product feedback by user experience testing and demos, guidance on the regulation journey, and insights for formulating the best pricing strategy. Providing demo experiences can support messaging development and the collection of competitive insights (based on individual KOLs experience levels with other systems).

→ This stage enables innovators to make any necessary adjustments to products and market expansion plans so that they are in the best shape to grow.

- **Early Market Expansion:** After a solution has been approved or modified to iron out any potential user challenges, it can be publicly launched with KOLs at the forefront of promotional activities. KOLs amplify initial product awareness by collaborating with innovators for activities such as research studies, trade show presentations, and online content development.

→ *Leveraging relationships around trade shows, especially during the early commercialization process, will help facilitate a smoother market entry into mainstream sales.*

- **Mainstream Market Expansion:** As a company expands to target mainstream users, KOLs serve as a primary adoption influencer within their extensive healthcare network for sales. They provide the familiarity and credibility that physicians and healthcare leaders require to consider exploring a new technology.

→ *This is the most difficult stage to get to and requires success within the first two (pre-market and early market expansion).*

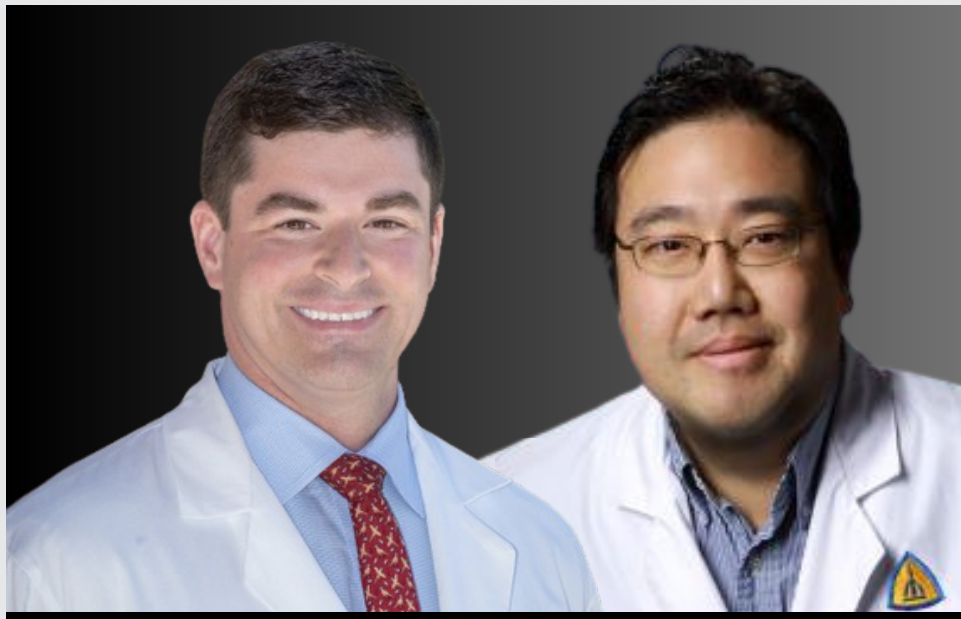
KOL relationships will differ based on individual companies' goals and budgets.

Working with a local partner with a pre-existing KOL network can prove beneficial, as innovators can save time on extensive list building and cold calling for KOLs. Just as KOLs influence physicians to purchase, research and marketing firms also can influence KOLs to work with AI innovators.

Beyond KOLs relations, what other activities are critical to accelerate AI adoption in healthcare?

INTERVIEW

AI in Healthcare Roundtable: Insights from Early Adopters Driving the Local Market



Dr. Alex (AJ) Blood

*Cardiologist and Intensivist at Boston's
Brigham and Women's Hospital (BWH)*

Dr. Danny Lee

*Chief Medical Informatics Officer at
Johns Hopkins Community Physicians*

*2015 recipient of the Innovations in
Clinical Care Award at Johns Hopkins
Community Physicians*

EXPERT

We interviewed 2 healthcare stakeholders who have recently adopted AI into their workflows. Each has experience working with different types of medical AI solutions, showcasing the variety of emerging use cases for the technology.

Dr. Alexander Blood fulfills multiple roles at Boston's Brigham and Women's Hospital (BWH). He is a Cardiologist and Intensivist, in addition to serving as the Associate Director for the Accelerator for Clinical Transformation research group and Senior Clinical Investigator at Mass General Brigham's Data Science Office.

Dr. Danny Lee serves as the Chief Medical Informatics Officer at Johns Hopkins Community Physicians. In 2015, Dr. Lee received the Innovations in Clinical Care Award for his work at Johns Hopkins Community Physicians. His specialties include internal medicine, information technology, computer networking, EHR/EMR, healthcare technology, and certified Epic physician builder.

Both interviewees bring unique perspectives on the current adoption of AI within their respective roles and healthcare systems.

INTRODUCTION TO TWO U.S. HEALTHCARE STAKEHOLDERS IN DIFFERING ROLES

Suzy: What is your background in the U.S healthcare system?

Dr. Blood: I am a Cardiologist and Intensivist at Brigham and Women's Hospital in Boston, Massachusetts. I also serve as the Associate Director for the Accelerator for Clinical Transformation research group and a Senior Clinical Investigator at Mass General Brigham's Data Science Office.

I spend about half of my time in the ICU clinically, and during the other three weeks, I do clinical research, consulting, advising, and venture capital work.

Technically, I work in the ICU, meaning I spend one week a month on clinical duties and the other three weeks performing clinical research, consulting, and advising in the business healthcare world.

I advise for private equity and venture capital, with private equity focusing more on large-scale acquisitions and group purchases and venture capital focusing on startups, particularly in the seed through series B stages.

EXPERT

Dr. Lee: Since 2013, I have served as the Chief Medical Informatics Officer (CMIO) for John Hopkins Community Physicians, part of the larger John Hopkins Madison enterprise. We are a primarily ambulatory-based community clinic throughout Maryland, DC, and Virginia.

We currently have over 30 to 35 sites running in those areas. I've been primarily involved in all things related to our health IT, especially our ambulatory clinics. I help direct almost all the ambulatory projects that we have going on.

I've also been heavily involved in several of our AI initiatives here at Hopkins.

RECOVERING FROM COVID-19 CHALLENGES AND TACKLING PROVIDER TURNOVER

Suzy: What are your current clinical initiatives? Organizational and/or division goals for 2024 and beyond?

Dr. Blood: Our team leads efforts for remote interventions across our health system and within our population health group while delivering scalable interventions and team-based care.

The onset of COVID-19 brought significant changes, and I have been focusing on the implementation of digital health and artificial intelligence at the group where I now serve, which is the accelerator for the clinical transformation group.

This role concentrates on the implementation of digital health and artificial intelligence technologies.

Dr. Lee: The main focus of the work I'm involved with right now is on clinical care and addressing the burden on healthcare providers. Provider burnout has been a significant issue, which predates the pandemic but has been exacerbated by it.

We've seen high turnover among support staff and providers. One factor contributing to this is the increasing workload associated with electronic health records, particularly the patient portal.

We're working to alleviate some of this burden by utilizing AI to assist with note-writing, decision-making, and managing in-basket messages. In addition to AI, we've also implemented personalized dashboards to help providers track their performance on quality metrics more easily.

EXPERT

However, while AI has the potential to save time by generating clinical notes, we're still evaluating the quality of these notes and the time it takes to review and correct any errors.

PROVIDERS EXPLORING MANY DIFFERENT AVENUES FOR AI — NEW SOLUTIONS PITCHED EVERY WEEK

Suzy: What is your experience with healthcare AI solutions?

Dr. Blood: I am pitched AI solutions every week. Exploring new solutions involves considering the following elements: clinical, financial, security, institutional, and vendor agreements. We've successfully implemented AI for administrative backends and coding.

My work in AI really started when I was a resident at Duke University. I was involved in starting a company and obtaining a patent for telehealth, telemedicine, and remote team management. At Brigham and Women's Hospital, I also had the opportunity to work under Dr. Rahul Deo, a leader in the fields of artificial intelligence and cardiology.

My experience with AI has developed over the past two years, starting with a project with General Electric Health. This journey has been a part of my work with the data science office at Mass General Brigham.

I also worked with Viz.AI on a project focused on how, with a 12-lead EKG, we used artificial intelligence to identify heart diseases such as hypertrophic cardiomyopathy or amyloid cardiomyopathy.

Most recently, I served as the Co-Senior and corresponding author for [an AI trial that was published in the New England Journal of Medicine](#).

Dr. Lee: Right now my organization is exploring various AI technologies for applications in clinical and business settings. We are pitched new solutions every week.

My focus as a physician is primarily on clinical activities. We aim to implement AI to assist providers with documentation and responding to in-basket messages.

EXPERT

From a broader perspective, we plan to utilize natural language processing to improve our ability to capture quality metrics hidden within clinical notes. This addresses the labor-intensive and manual process that requires significant human input to review notes for quality metrics. Such tasks, which are repetitive and tedious, are better suited for AI, given its ability to work consistently without getting tired or bored. **The decision-making process involves multiple stakeholders and committees, with financial considerations also playing a significant role as AI technologies are not inexpensive.**

Given its novelty, predicting the long-term trajectory of AI technologies is challenging. However, as more companies emerge in the field and the technology becomes more mainstream, costs are expected to decrease.

We are also seeing smaller startup companies utilize open-source AI and integrate different models to create a more customized approach. AI technologies will likely become more specialized, with certain models better suited for specific tasks, and there may be a convergence of these technologies.

VARYING PERSPECTIVES ON AI IN THE MEDICAL FIELD

Suzy: What is the current sentiment around AI in your own network? What conversations are being had, and what are the opinions from your viewpoint?

Dr. Blood: It will be part of the future and will be much more gradual than most people think. Many diseases may not be apparent to the naked eye, but we can identify them much earlier with the tools and technologies available with generative artificial intelligence.

This allows us to diagnose diseases that may never have been identified otherwise. These are some really cool AI applications that we're starting to see. It's the beginning of a very exciting wave of AI.

Zak Kohane, the editor of New England Journal of Medicine and a seasoned clinician, has been involved in artificial intelligence and healthcare for 40 years. He is considered one of the godfathers of medical AI.

EXPERT

One of his statements that deeply resonated with me was that AI will never replace doctors. Instead, doctors who embrace AI will replace those who don't, as they will become more efficient, accurate, and their patients will have better outcomes.

I believe this is an undeniable truth that I have now borrowed from him.

Dr. Lee: It's like anything else with new technology - there's that initial honeymoon phase/period of excitement, followed by disenchantment, and then the industry settles somewhere in the middle in reality. And I think we've gone through all three phases of it.

There was the initial reaction of, 'God, that was so incredible and awesome', and now the reaction is like, 'Why is it getting this? It missed this physical exam; it missed this; it missed that.'

The disenchantment period is happening, and medical providers and staff are now adjusting to it.

When AI first emerged in the field, I wanted providers to continue practicing the way they normally do and not adjust their practices to AI, but that has not happened.

Instead, because AI has limitations, providers are now adjusting to the limitations they see in AI models and are shifting their practice around AI. **In my opinion, AI should rise to you. It has to meet to your level, not you come down to it.**

I would say about half of the AI notes we're getting right now must be edited. It's not necessarily a bad thing. But does editing the note take more time than writing it? I have no idea.

FINAL TAKEAWAYS FOR AI INNOVATORS SEEKING U.S. EXPANSION

Suzu: What advice would you give an AI innovator seeking to work with a healthcare industry expert like yourself?

Dr. Blood: Be prepared. Know what you know and know what you don't know.

Make sure you know who your customer is and whose problem you are solving.

EXPERT

Dr. Lee: For starters, definitely do your research.

The second thing is to avoid relying on sales jargon and over-romanticizing/over-promising a solution's capabilities

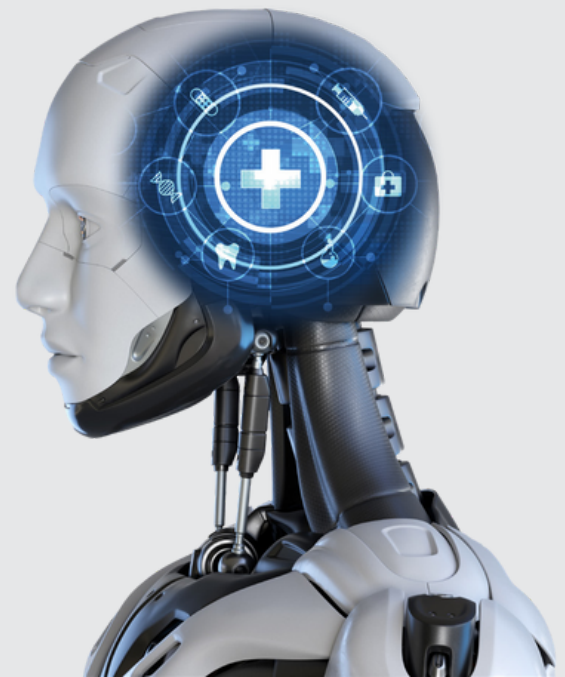
For example, one of the companies I formed an agreement with scheduled a meeting between me and an engineer - not a salesperson. He was very plain-spoken, underselling the full capabilities of the product, which made me find the technology even more appealing.

When you're underselling something, you can see the potential in the product, and you think, 'oh you're underselling me. Oh, okay. I like it. You know, you're playing hard to get. I like you more.'

Growing Indications for Healthcare AI in the U.S. Market - Analysis of 2024 Authorizations and Interview with a S. Korean Innovator Seeking FDA Clearance

Since 1995, the U.S. FDA has authorized 882 AI and ML-enabled medical devices. Thus far this year, 42 additional devices have been authorized (from January to June 2024).

We have provided one product example per indication below to showcase the range of healthcare AI solutions that are expanding within the U.S. market.



EXPERT

Company	Country	Device	Indication	Description
 Nano-X AI Ltd.	Israel	HealthFLD	Radiology	Software for liver attenuation analysis from CT scans.
 Coreline Soft Co., Ltd.	S. Korea	AVIEW CAC	Radiology	Coronary artery calcification analysis solution.
 Ortoma AB	Sweden	OTS Hip	Orthopedic	Software for preoperative planning, intraoperative navigation, and postoperative follow-up of hip implant surgery.
 HOLBERG EEG Holberg EEG AS	Norway	autoSCORE	Neurology	Automatic event detection software for full-montage electroencephalograph.
 Stryker Instruments	USA	SurgiCount+ System	General and Plastic Surgery	Image processing device for estimation of external blood loss.
 Cosmo Artificial Intelligence - AI Ltd	Ireland	ColonPRO 4.0 (CPRO40.US)	Gastroenterology-Urology	Gastrointestinal lesion software detection system.
 X-Nav Technologies	USA	X-Guide Surgical Navigation System	Dental	Dental navigation system.
 Eko Health, Inc.	USA	Eko Low Ejection Fraction Tool (ELEFT)	Cardiovascular	Reduced ejection fraction machine learning-based notification software.
 EnsoData	USA	Aurora	Anesthesiology	Ventilatory effort recorder.

EXPERT

Of the list for 2024, only one S. Korean company is featured. Coreline Soft develops an AI-based diagnostics package specializing in lungs. The innovator has received 9 FDA clearances since 2018 and seeks to launch additional, more in-depth lung diagnosis products in the future.

The continued authorization of AI and ML-enabled medical devices by the U.S. FDA, particularly across fields, highlights the critical role AI is playing in addressing healthcare challenges.

Radiology makes the majority of indications for the full list of authorized solutions.

See a full breakdown below.

- 73.3% radiology
- 8.9% neurology
- 4.4% cardiovascular
- 4.4% orthopedic
- 2.2% anesthesiology
- 2.2% gastroenterology-urology
- 2.2% general and plastic surgery

It is no surprise that radiology authorizations are so high, given the significant challenges plaguing the U.S. radiology profession right now.

The American College of Radiology's career center has over 1800 vacant positions listed while at the same time, patient demand has increased nearly 10% for radiology physicians.

The growing dependence on imaging for diagnosis, combined with an influx of patients, has placed healthcare facilities in a race to keep up with demand using a limited number of radiologists. AI is one of the top solutions radiology professionals are considering to keep up with demand.

As demand for AI solutions grows across indications, global innovators will continue to race to secure clearance and the necessary industry credibility to cross the chasm for full sales penetration.

Where are S. Korean medical AI innovators with FDA clearance?

We also analyzed 6 of the top 10 AI healthcare startups in S. Korea (per Tracxn's database ranking of 2023) to see how far leading innovators have gotten with receiving U.S. FDA clearance.

EXPERT

Lunit:

- Most recent FDA clearance: Lunit INSIGHT DBT | 2023
- AI that detects early-stage cancer and optimizes cancer treatment.

VUNO:

- Most recent FDA clearance: VUNO Med®-DeepBrain® | 2023
- Atrophy and WMH measurement AI solution to assist diagnosis of neurodegenerative diseases.

Medipixel

- Most recent FDA clearance: MPXA-2000 | 2023
- AI-enhanced services and products for interventional cardiology.

NEUROPHET:

- Most recent FDA clearance: Neurophet AQUA | 2023
- AI solutions for diagnosis support, treatment guides, and treatment devices targeting brain diseases.

AITRICS

- No FDA clearance
- AI-based medical device to monitor patient conditions in real-time and predict the risk of deterioration

ROKIT

- No FDA clearance
- Patent-pending AI technology to simplify complex surgical procedures that involve 3D scanning, modeling, and bio-printing.

Of the 10 top startups, only 4 have secured FDA clearance thus far. Although each has seen success in the local S. Korean market, U.S. expansion is still in its early days.

S. Korean innovators have the proven technical acumen to support U.S. market needs, but must ultimately form KOL relationships to speed up market growth.

EXPERT

BDMT Global is dedicated to leading the DAC Global Connection Movement movement and invites others to join.

Now is the time to act. The U.S. is still in a growth stage and seeking new solutions for challenges across different industry verticals.

Are you ready to join the wave of opportunity in 2024 and beyond?

If you are interested in potential partnerships and long-term relationships with the companies mentioned in this article or others in the U.S. and/or S. Korea, contact Suzy at sim@bdmtglobal.com.

Suzy Im

As the head of BDMT Global in Boston, Im focuses on accelerating the innovative transformation of global companies. She is a Professor of Marketing and a member of the Advisory Board at Emerson College. Im is also co-founder of Sponsors of the Future, a non-profit organization that leads corporate social responsibility, promoting neurodiversity and inclusion.. As a well-known business developer and marketing strategist in the global field for over 20 years, Im merged the two critical global business functions of Business Development (BD) and Marketing Transformation (MT) for the first time. She was recognized for her innovative business model and contribution and received five consecutive awards in the U.S. including the North American Business Awards and TITAN Business Award 2022 in Biotechnology.

