Healthcare and Life Sciences Your quickstart guide to generative Al

Google Cloud



Boost innovation and productivity with gen Al for healthcare and life sciences.

\$15-35B

Gen Al potential value across the life sciences

Generative AI is helping transform the healthcare and life sciences (HCLS) industry. Key markets are experiencing rapid transformation due to gen Al including biotechnology, pharmaceuticals, and MedTech and medical devices.

Tasks that HCLS companies see as bottlenecks generating interoperable insights, personalizing experiences, driving sustainable operations, and enriching customer interactions - now have the potential to flow more seamlessly.

industry in North America¹

1,700**DNA and life sciences-related** patents generated in 2021 by the top 20 pharmacos and the top 20 medtech companies²

Across domains, gen Al is helping create real value. It has the potential to help unlock insights from previously untapped data sources to find accurate information faster, enhance drug discovery, enhance patient care, and streamline internal processes.

Find out how your organization can realize value from gen Al in the following markets.



MedTech and medical devices

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Ready to go?



Ol Biotechnology

Biotech companies focus on cultivating relationships and building trust with care providers, pharmacists, insurers, and patients — all of which can be deepened using gen Al tools. For researchers, gen Al can improve each step of the discovery process — from lab experimentation to the prioritization of hypotheses. This could lead to the expediting of treatment development and personalized therapies, which could lead to better patient experiences.

For marketers, gen Al can help accelerate content approval, business development, and compliance checks, while also synthesizing complex data. It can also help enable brand leaders to refine campaign strategies in real time.

3. McKinsey. (2024). Generative AI in the pharmaceutical industry: Moving from hype to reality.

4. McKinsey. (2023). <u>The economic potential of generative AI: The next productivity frontier</u>.

5. McKinsey. (2023). How generative AI can boost consumer marketing.

Early adopters of gen Al could stand to gain a competitive edge. From indication finding using advanced medical models to streamlining regulatory submissions with natural language processing, these companies are experiencing accelerated clinical development. You can, too.

30-45%

projected improvement of current servicing costs in customer service with gen Al⁴

\$15-28 billion

in operating profits from gen Al in life sciences³

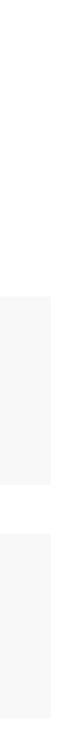
5-15%

potential increase in marketing productivity with gen Al⁵

20-45%

of current annual spending on the function is the productivity of software engineering⁴





Key considerations Evaluate tech partners.

The future of gen Al for biotech is reliant on a holistic tech stack. Biotech companies can consider a comprehensive gen Al solution that allows them to easily deploy new use cases without having to stitch together point solutions.

Google's cohesive, integrated <u>gen Al platform</u> can cover the entire data value chain in one platform — giving you a 360 view of your business. For example, wth <u>Vertex Al Search</u>, you can build a Google-quality search app on your own data and embed a search bar in your web pages or app. Plus, rapid time to insights can free you from the risks of disparate vendors and competing agendas.

Enhance your multimodal data foundation.

Gen Al helps leverage huge amounts of data across multiple modalities, including image, chemistry, natural language, and large molecule data. Think creatively about what sources of data your competitors do not have and use gen Al to generate more actionable insights based on your multimodal data.

Prioritize gen Al use cases.

For research in biotech companies, Gen Al helps drive value in three key areas: speed, cost efficiency, and probability of success. Gen Albased identification of scientific insights from patents, publications, web, and clinical trials can enhance all three of these areas.











Educate employees for an evolving ecosystem.

the most of gen Al. Coach your employees Al tools, and how to use them safely in environments with patient data. Customer complex cases and prevent bias.

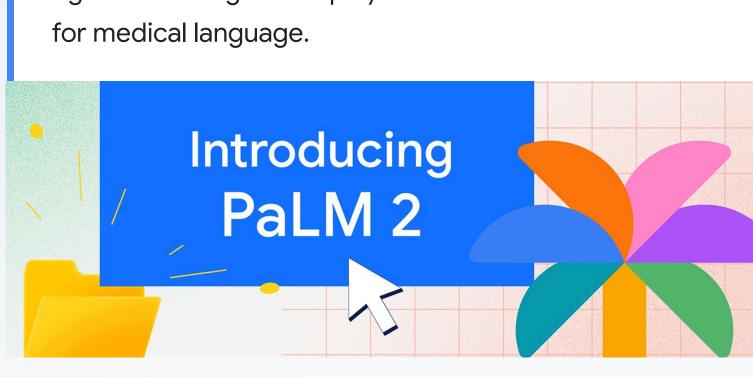
To plan for effective change management, communicate new responsibilities to your changing regulations, and create a culture focused on the responsible use of gen Al.

- Investing in your people will allow you to make around prompt generation, when to leverage service agents can act as a 'human-in-the-loop' to provide expert guidance to customers on
- employees, update internal policies in line with

Adhere to changing regulations.

Al algorithms often require access to large quantities of patient data, and can use the data differently over time. To ensure confidentiality and data integrity, prioritize security measures like encryption, access control, and audit trails. It's also important to ensure new quality checks on Al-led processes that were once human-led, such as drug discovery.

Med-PaLM 2 helps you implement rigorous testing and deploy LLMs tailored







Personalize the experience.

From research to insights, gen Al can help you transform your value chain. In research, gen Al can help expedite the development of treatments and personalized therapies, accelerating the advancement of healthcare solutions.

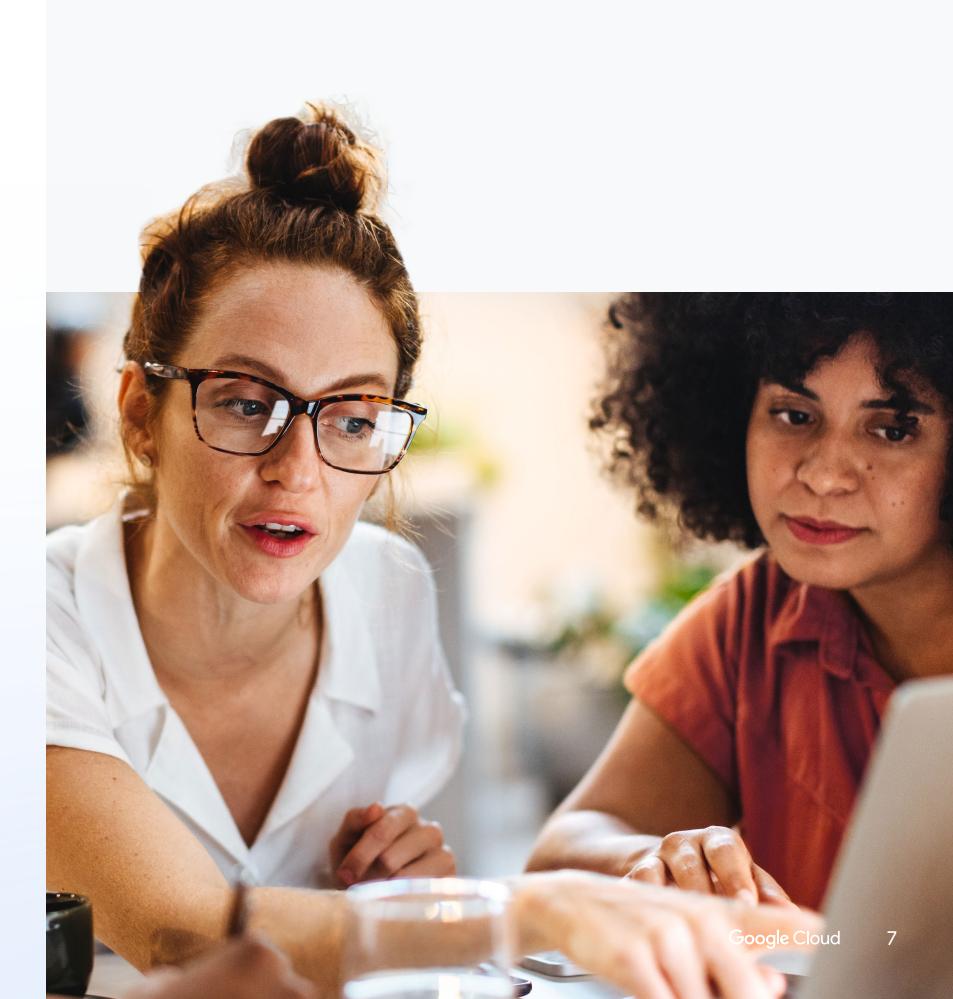
In clinical operations, you can use gen Al to personalize communications such as emails, improving the overall experience.

70%

of business activities will potentially be automated by 2030⁶

Drive sustainable and efficient operations.

Biotech companies can leverage gen Al to drive efficiency and improve sustainability by automating operations across the entire value chain. This could include screening candidate compounds *in silico, limiting the in vitro and in vivo* screenings, and auto-generating regulatory documents. Biotechnology







Strategies Enrich customer interactions.

Biotech companies can also leverage gen Al to improve customer service.

With enhanced insights on patient behavior, gen Al can also strengthen service conversions by prompting agents with suggested topics and questions, supporting employees in MSL and sales representative roles. Meanwhile, Al-powered chatbots can handle professional and patient inquiries more efficiently, increasing employee productivity and reducing operational costs.

Enhance outcomes from clinical trials.

Gen Al can help companies assemble more diverse and representative clinical-trial populations. Additionally, the use of models that examine genetic

and phenotypic data alongside real-world data, can help researchers better understand why different subgroups of patients respond differently to the same treatments ultimately enhancing quality of personalized care.

Gen Al can be used to identify new biomarkers of diseases. These improvements are key to shorter, more efficient trials with a greater likelihood of success.









Ginkgo is developing new, state-of-the-art large language models (LLMs) using Google Cloud's Vertex Al platform, enhancing innovation in fields like drug discovery, agriculture, and biosecurity. They are making Google Cloud their primary cloud services provider, significantly increasing their cloud computing resources to position both Ginkgo and its customers favorably as cloud computing needs grow.

GINKGO BIOWORKS

Read the full story





02 Pharmaceuticals

For pharma companies, Gen Al can accelerate the process of identifying compounds for possible new drugs, as well as speed up their development and approval. These advances could contribute to reducing the global burden of disease. Streamlining the drug discovery process means reducing the time and resources required for pre-clinical testing and drug development, possibly leading to substantial cost savings and better patient outcomes. Gen Al can be helpful for researchers who are trying to speed up the research phase significantly. It also has the potential to help take the actionable insights gained from gen Al and use it to boost productivity and improve the way drugs are marketed once they're developed.

\$60-110 billion

Expected annual value from gen Al across the pharmaceutical industry value chain (globally)³





Key considerations

Evaluate tech partners.

The future of gen Al for pharma organizations is reliant on a holistic tech stack. Pharma companies can consider a comprehensive gen Al solution that allows them to easily deploy new use cases without having to stitch together point solutions.

Google's cohesive, integrated <u>gen Al platform</u> can cover the entire data value chain in one platform — giving you a 360 view of your business. Plus, rapid time to insights can free you from the risks of disparate vendors and competing agendas.

Prioritize gen Al use cases.

Pharma companies can look at gen Al use cases across the value chain to determine which can drive maximum value for the patients and lifesciences ecosystem.

This prioritization will differ from company to company. For example, accelerating speed of discovery and development or improving cost efficiency across the value chain might be more of a priority for your organization. Early estimates show the highest potential of gen Al in drug discovery, development, and commercialization.⁷

20%

increase in the possibility of success for trials with gen Al³

In drug discovery, gen Al can help accelerate speed to market, improve cost efficiency, and increase value capture. In clinical drug development, gen Al can help deliver proactive alerts — with data-driven tagging of risks and prescriptive recommendations of early interventions to support on-time trial delivery.

For commercialization, gen Al can help synthesize and curate brand and healthcare personnel (HCP) data, and generate real-time insights around interactions to ensure seamless coordination and optimization of sales efforts.

10%

reduction in trial cost and duration with gen Al³





Enhance your multimodal data foundation.

Gen AI helps leverage huge amounts of data across multiple modalities like molecular structures, clinical operations, and patient data. Think creatively about what sources of data your competitors do not have and use gen AI to generate multimodal data to generate more actionable insights.

Combining traditional and gen Al in data management for pharma can potentially lead to:³











Key considerations

Balance the riskreward trade-off.

Pharma companies are highly regulated, and handle highly confidential and sensitive information that directly impacts patient outcomes. As a result, it is essential they carefully assess the risks posed by gen Al. To address and mitigate risks, embed security and data privacy requirements across all tools to remain compliant with regulations and preserve HCP and patient trust and ensure that humans always make the final decisions. Ensure explainability in the gen Al outputs and that gen Al

outputs are factually grounded on enterprise data and adheres to brand guidelines, again using human oversight for precision and validation.

Google's Chronicle uses gen Al capabilities to help organizations defend against threats. Chronicle is a cloud-naive SecOps platform that uses natural language to search your data, iterate, and drill down, using gen AI to create summaries of findings, and, in the future, create detections and also create playbooks

Educate employees for an evolving ecosystem.

Investing in the development of your workforce will enable you to maximize the benefits of gen Al. Train your employees on prompt generation techniques, educate them on when and how to utilize AI tools, and ensure they understand how to handle patient data securely. Customer service agents can play a crucial role as a 'human-in-the-loop' to offer expert assistance to customers in complex situations and prevent biases.

To successfully implement changes, it is important to effectively manage the transition. This involves clearly communicating new responsibilities to your employees, updating internal policies to align with evolving regulations, and fostering a culture that prioritizes the responsible and ethical use of generative Al.







Personalize experiences from research to insights.

Patients and HCPs expect personalized interactions from medicine manufacturers. With gen Al, there is further potential to personalize trial engagements and insights.

Clinical operations managers could deliver trials faster and more efficiently with actionable insights and personalized engagement through gen Al. For example, gen Al can power personalized site engagement and can automatically draft personalized messaging to engage PIs and site coordinators, with high engagement based on tailored content

and timing. Also, an interactive gen Al-powered companion can help patients in clinical trials for personalized 24/7 support and monitoring of real-time outcome, with connection to the trial site care team.

In commercialization, sales representatives who use gen AI can more quickly create personalized engagement plans, for example, more personalized messaging, leveraging synthesized and curated brand data and HCP-specific data using gen AI. This could lead to a two or three-fold boost in engagement.³

71%

of consumers expect companies to deliver personalized interactions (including with HCPs)⁸ Using gen Al in customer enablement for pharmaceuticals can lead to:³

10-15%

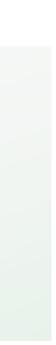
improvement in the productivity and effectiveness of field teams

1-2%

in top line growth







Generate interoperable insights.

Gen Al can help integrate diverse and interconnected healthcare datasets to enable seamless communication and integration across different platforms and legacy systems. This helps pharma companies extract valuable insights from data that would have otherwise been untapped.

A gen Al-enabled regulatory intelligence engine in pharma can have a potential impact of:³

30%

faster responses

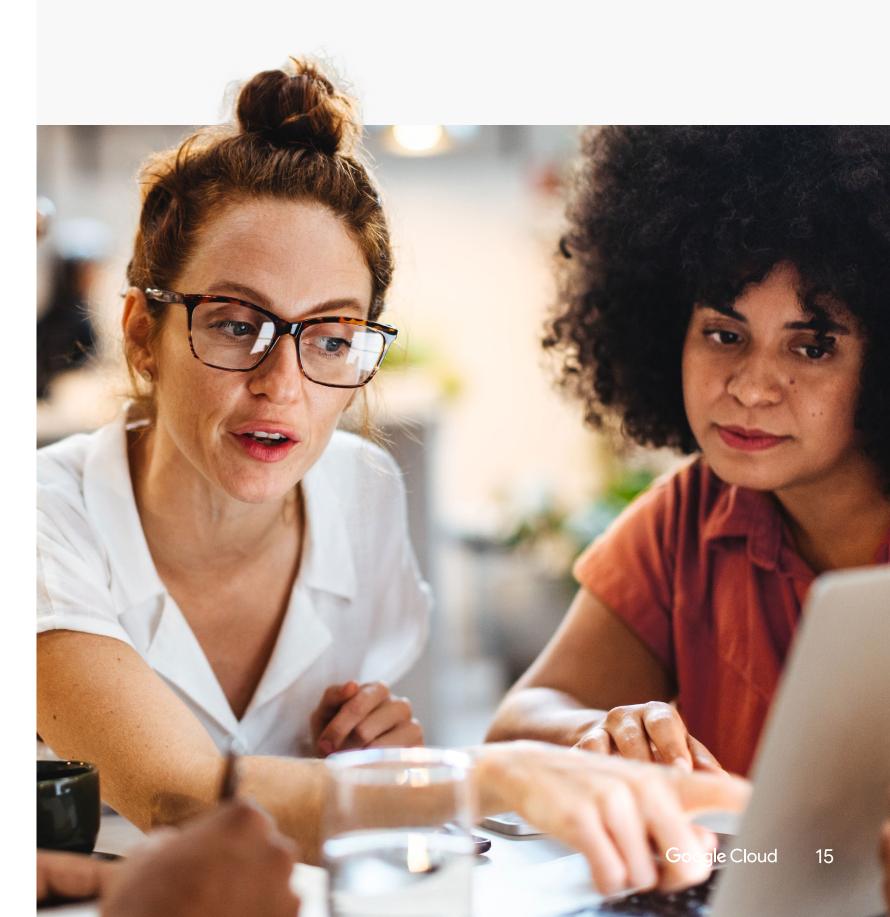
50%

fewer HAQ follow-ups

35%

increase in productivity with gen Al³

Pharmaceuticals 2







Drive sustainable and efficient operations.

Automation is the key to sustainable and efficient operations. By automating operations across the value chain, leading pharma companies can enhance their productivity more than ever before.

Generative AI can help researchers more easily access, identify, and correlate large troves of research data for possible connections. By removing barriers between systems and infrastructure, gen AI can reduce costs across the discovery process. Products like <u>Vertex AI</u> <u>Feature Store</u>, built with BigQuery, can break down infrastructure silos and help you access disparate data sources faster. Additional applications could include screening candidate compounds, analyzing trial performance insights, auto-generating trial documents and regulatory documents, synthesizing content for medical or commercial functions, and reporting on quality and deviations in manufacturing.



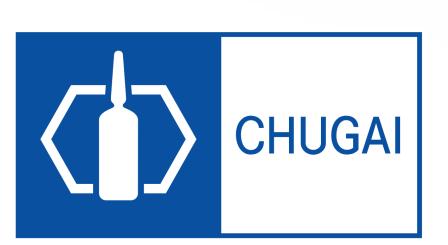
Enrich customer interactions.

Marketers, field reps, and other customer-facing teams have huge amounts of information at their disposal. With gen Al, customer interactions, commercialization processes, and campaigns can be brought together to uncover unique, actionable insights.

Insight-driven campaigns can enable richer, more targeted conversations between field staff and care providers. And gen Al-powered chatbots can speed up the delivery of crucial information — quickly delivering accurate, personalized, and timely responses to patients inquiring about drug interactions, side effects, and dosage adjustments.







Chugai will leverage Google Cloud's AI technology to improve the success rate of drug development, significantly reduce the time and cost of the drug discovery process, and achieve overwhelming efficiency and innovation. Chugai's use of AI will enable the inference of more than 1000 protein structures per day. This integration with Google Cloud will drastically cut the research process to just months, shortening the time to efficiently create more drug candidates.

<u>Read the full story</u>





MedTech and medical devices

The MedTech and medical devices market is expanding — fueled by an aging population, a desire for personalized medicine, and an increase in chronic diseases. Despite growth, the industry remains riddled with challenges. Slow R&D, costly device development processes, manual data analysis, and limited personalization are acting as bottlenecks to true innovation.

Gen Al can help a range of teams across MedTech. For product development, gen Al can boost the hardware design process by analyzing scans and generating customized designs. For sales and marketing, gen Al can automate document creation, personalized outreach campaigns, and promotional texts, while also simplifying customer support tasks by automating complaint evaluation and resolution.

For regulatory teams, gen Al's ability to analyze large volumes of data can help streamline and enhance quality management systems and documentation processes.





Key consideration

Evaluate tech partners.

MedTech companies can prioritize the adoption of platform-based solutions, such as single-provider gen Al platforms, over model-based solutions. This approach helps you to adapt to dynamic market conditions and accelerate development, while also ensuring flexibility and avoiding dependency on specific vendors.

Opting for a single-provider gen Al platform can be a powerful force-multiplier to drive broader impact, so you can respond to changing market conditions and build quicker.

Develop a foundational infrastructure.

Investing in the right infrastructure is paramount to running gen Al models efficiently and avoiding data silos.

While ensuring the smooth integration of Al solutions with existing medical device systems is critical, choosing a scalable solution will enable you to grow your gen Al capabilities in the future.



Key consideration

Prioritize data that matters most.

Accessing and leveraging disparate data that's spread across different legacy systems is critical to unlocking the most value from your data and insights.

Gen Al can help you unlock internal data like electronic health records and medical devices, and external data — like genomic databases and research publications — to discover this value.

Remember, using high-quality, clean, and relevant data is the key to the adequate training and validation of gen Al models. Focus on working with data that can provide unique insights beyond what you already have.

Focus on quick wins with a long-term strategy in mind.

Solutions that require lower upfront investment and can be implemented easily while also delivering demonstrable value and quick ROI — can help you find momentum in the gen AI space.

Gen Al has the potential to improve patient experience and engagement in a meaningful way. Use gen Al to help personalize patient interactions including answering questions, scheduling appointments, and offering basic medical advice.

To enhance operational efficiency, use gen Al-powered image analysis to automate defect detection, improve product quality, and reduce waste.

Adhere to changing regulations.

To safeguard the privacy and integrity of patient data, it is crucial to implement robust security measures when utilizing AI algorithms, as these algorithms often rely on extensive amounts of patient data and may evolve in their data usage over time. Prioritizing security measures such as encryption, access control, and audit trails is essential. Additionally, it is important to establish new quality checks for AI-driven processes, such as drug discovery, that were previously conducted by humans — to ensure accuracy and reliability.





Key consideration

Balance the riskreward trade-off for responsible Al.

To prevent IP infringement and boost data privacy, train models on IP and write IP protections into contracts. Be aware of data privacy regulations, like keeping patient medical data on domestic servers.

For improved model accuracy, place guardrails on gen Al content, such as ensuring that content is reviewed by humans before being distributed. Gen Al should never be the final decision maker in a workflow.

Furthermore, gen Al models can perpetuate existing biases in healthcare data, requiring careful training and interpretability to ensure fair and equitable outcomes.

Ensure talent and organizational readiness. Here are some ways you can ensure your organization is Al ready:

Build the right team by hiring Al specialists, domain experts, data and analytics experts, and project managers.

Establish a collaborative culture to break down silos and foster shared understanding.

Vertex Al's Explainable Al helps MedTech companies mitigate bias and promote transparency.

EXAMPLE Plan for effective change management by communicating new responsibilities to employees and updating internal policies in line with the changing regulatory landscape.



Invest in gen Al skills training for staff to ensure the effective deployment of these new tools.





Personalize the experience.

Today, patients expect a personalized experience, and MedTech companies can leverage gen Al to help deliver. Gen Al can help you design and manufacture medical devices tailored to individual patient anatomy and physiological parameters to ensure optimal fit and efficacy.

Gen Al can also be used to predict individual patient responses to treatments and devices, optimizing trial designs and tailoring future therapies for more effective outcomes.

Generate interoperable insights.

MedTech companies have volumes of data from multiple systems and platforms. If your data remains siloed, you'll struggle to extract its value. Leveraging gen Al can help you connect multiple datasets and sources to ensure that the insights you are getting are invaluable.



Drive sustainable and efficient operations.

Boosting R&D is high on the priority list for MedTech companies. Gen Al can help you test and refine medical device designs virtually before physical prototypes are made. The outcome? Reduced material waste and accelerated development cycles.

Gen Al can also help streamline your supply chain and manufacturing operations by boosting demand forecasting and inventory management. And it can also help in the selection and design of sustainable material.

Enrich customer and healthcare personnel interactions.

Gen Al has the ability to help transform customer interactions. Gen Al can proactively identify service and repair needs using unstructured customer feedback and device data, generating user instructions for customer service needs using natural language and addressing product questions and simple repairs (via ChatBot) using LLMs.

For HCPs, you can auto-generate content for engagement and brand messaging using large language and image models, as well as help answer HCP sales questions using customer service chatbots. Leading MedTech companies are starting to integrate gen Al into their products and software, such as by leveraging voice prompts as well as applying Al capabilities for remote patient monitoring, detecting early warning signs, and providing personalized feedback and support.







HCA Healthcare is using generative AI and Google Cloud to redesign patient care. Using automation to support its healthcare workers and improve the efficiency of workflows, doctors and nurses can now spend more time with their patients and less time analyzing data and extracting insights.

Watch the full story





Get started with gen Al for HCLS.

We've covered a number of considerations for adopting gen Al in your organization. Here are some key steps that you can prioritize, today:

Align on vision and commitment from the leadership team by prioritizing key domains based on impact and transformation feasibility as well as business and P&L implications.

Create a roadmap by identifying pilot

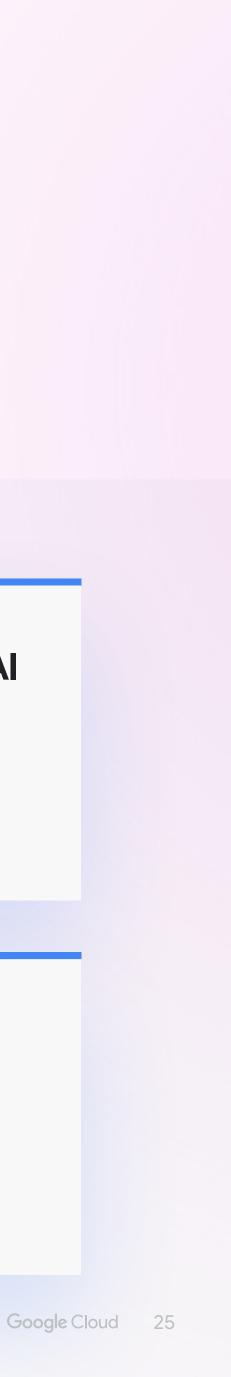
use cases in prioritized domains and planning for scaled use cases.

Assess foundational capabilities for gen Al

to make sure you have the right people, technology, and models in place.

• Plan for company-wide adoption

ensuring skill building and responsible Al practices are at the core.



Time to take action with gen Al?

When a new technology moves as fast as gen Al, it can be hard to keep up. Google Cloud helps you solve for all the considerations outlined in this guide.

Our gen Al tools are backed with frameworks, tools, and governance structures to help you hit the ground running.



<u>Contact us</u> to set up time to discuss how to get started on your gen Al journey.

Google Cloud

