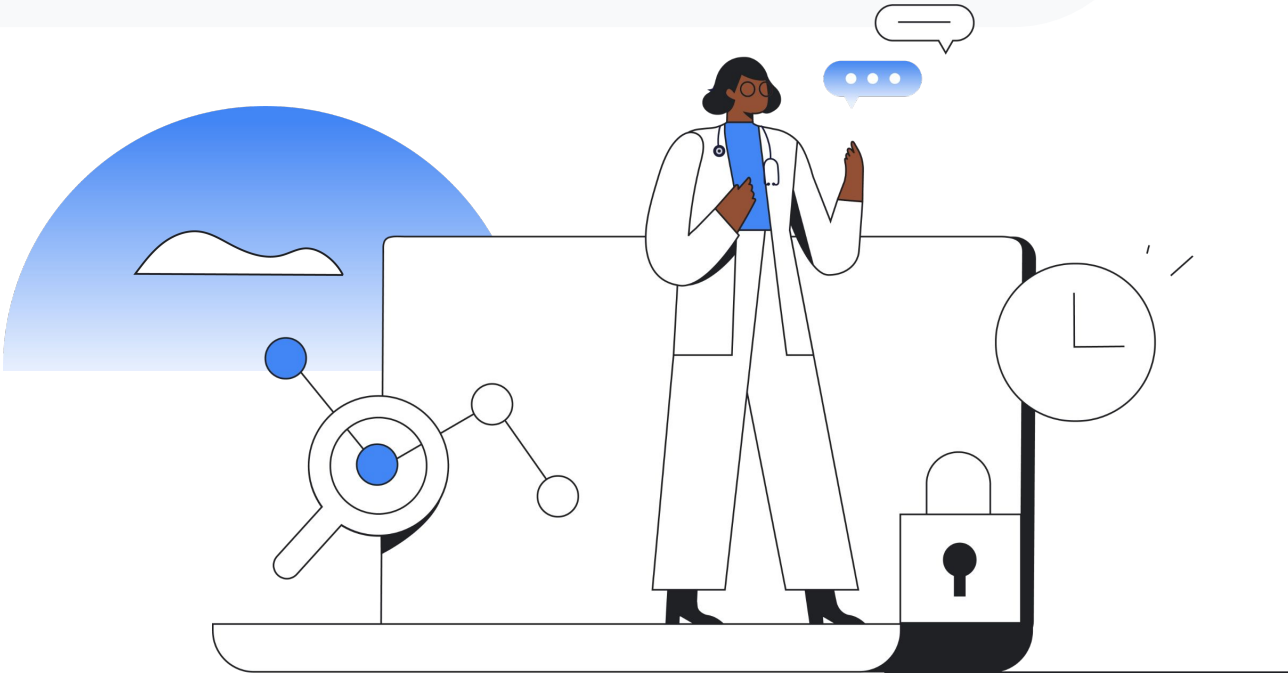
Google Cloud

Healthcare Data Interoperability

Fulfilling the promise of value-based care



Introduction

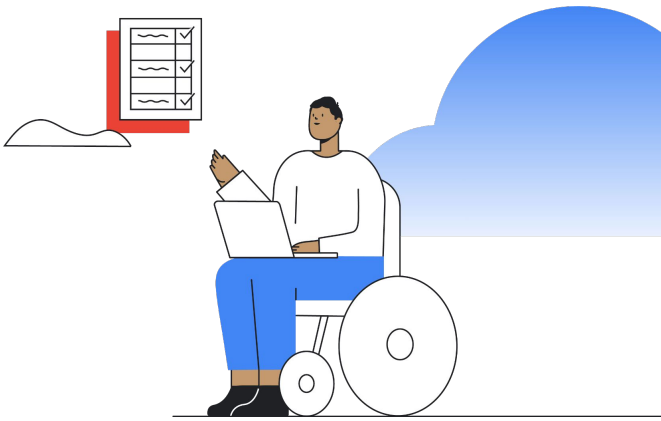
When providers and health plans can share timely health information, the patient wins. Instant access to data helps care teams tailor treatments and encourage healthier choices—without assembling medical histories manually, repeating tests or procedures, waiting on hold for claims pre-approval, or ever using a fax machine. **Data interoperability lays the groundwork for healthier outcomes.**

Two major events have accelerated data harmonization across the healthcare industry: the COVID-19 pandemic and the U.S. 21st Century Cures Act. In this ebook, we share stories of game-changing efforts that go beyond regulatory compliance and reveal massive opportunities for innovation in value-based care. This isn't about replacing old plumbing with new pipes. It's about reimagining the way healthcare works.

Health plans and providers must embrace data interoperability to deliver the healthcare experiences consumers expect but so often find frustratingly absent.

Google Cloud, along with forward-thinking health organizations, is embracing the digital healthcare revolution to create meaningful connections for a healthier, happier world. Traditional competitors are working together to reach patients who might not otherwise receive care, and previously disconnected care teams are getting a more complete picture of each patient for better care coordination.

The articles in this ebook describe how data interoperability improves the lives of real people, from making it easier for health experts to identify those at risk for COVID-19 complications, loneliness, or depression, to empowering consumers with better tools for managing their own care. Read on to explore breakthroughs made possible by integrating data, and to catch a glimpse into healthcare's future — one without fax machines.



Let's dive in...

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We engaged some of the healthcare industry's most innovative leaders in conversations about the challenges and opportunities of achieving data interoperability. Read about the approaches to data interoperability their organizations have taken, and the wins they have experienced along the way.

Google Cloud

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Catalysts for Innovation: The 2021 ONC and CMS Regulations

New rules are unlocking data interoperability for the healthcare ecosystem, opening the door to innovations that will empower health plans to strengthen connections with their members and guide them toward better health.

Two new U.S. regulations that take effect this year are not only making it easier for health plans to improve the healthcare experience and quality of outcomes for their members, they are laying the groundwork for potential innovation that goes far beyond simple compliance. The Office of the National Coordinator for Health Information Technology (ONC) Cures Act Final Rule requires that patients have secure access to their electronic health information to use and share as they please, and the Centers for Medicare and Medicaid Services (CMS) Interoperability and Patient Access Rule requires that health plans participating in federal exchanges share claims data with patients electronically.

"These rules are basically a call to action to payers to unlock data silos so that consumers have a 360-degree view of their data," says Amol Vyas, Chief Architect for Cambia Health Solutions.

By requiring that healthcare organizations convert data into the Fast Healthcare Interoperability Resources (FHIR) standard, the regulations serve as a forcing function for health plans and providers to improve the quantity and quality of data they share with patients. The idea is to enable patients or members to make more informed decisions about healthcare plan purchases, treatments options, and lifestyle choices.

> These rules are a call to action to payers to unlock data silos so that consumers have a 360-degree view of their data."

Amol Vyas, Chief Architect for Interoperability, Cambia Health Solutions

Putting all the data generated by different systems in a common format is a major benefit for consumers. To use the analogy of a musical score, musicians may perform beautiful solos on their own, but they need to synchronize their sounds when they play together. That's why composers represent pitches, rhythms, and pauses in standard notation that all musicians understand and translate into music. Bringing the individual parts together in a single musical score allows the conductor to interpret the piece, so that listeners hear a glorious performance instead of a cacophony of solos. In a similar way, a common data format allows health plans to present members with a full, insightful picture of their health, rather than leaving them to interpret disjointed or overlapping fragments of information on their own.

> "As we think about a patient navigating and accessing their data, and then using it in scenarios where they're engaging with their providers and payers, it's really important to think about how to reduce friction in all those user journeys."

Neha Kumar, Vice President of Product Management, Oscar Health

Advantages of interoperability

In calling for a standard, interoperable data format, the ONC and CMS rules encourage healthcare players across the ecosystem to combine healthcare data and conduct more harmonized experiences for patients, which will not only improve the lives of patients, but also make healthcare organizations more competitive.

"As we think about a patient navigating and accessing their data, and then using it in scenarios where they're engaging with their providers and payers, it's really important to think about how to reduce friction in all those user journeys," says Neha Kumar, Senior Director of Product at Oscar Health. "When you go to the doctor's office, how easy is it to share your data so that your doctors can make a well-informed clinical decision?" Making it easier to access and share relevant, high quality data will improve the overall healthcare experience for consumers.

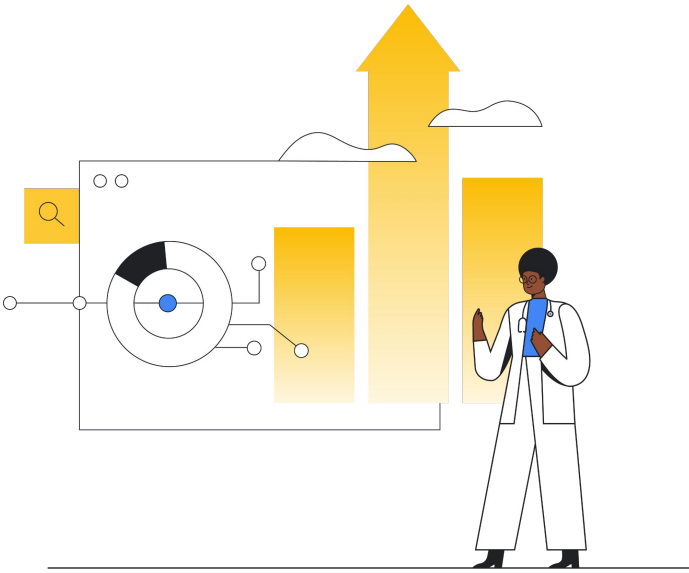
But the new rules benefit organizations too. "Many leading organizations are using their investment in interoperability as a differentiator," observes Amy Waldron, Director of Healthcare at Google Cloud. "It's a catalyst to improve stakeholder experiences, collaboration around care, and outcomes and innovation."

Reddi Gudla, Vice President of Digital Engineering at Anthem, agrees. “Anthem is adopting a digital-first, human-centered approach in connecting with consumers, putting them at the center of everything we do,” he says. Digitizing archaic frameworks and extracting data from artifacts—some as old as twenty-five to thirty years—will help Anthem and other industry players catch up to other industries, like telecommunications and banking, that currently do a better job of translating historical data into sophisticated technology experiences.

For example, sharing data among healthcare organizations will create an opportunity to simplify the pre-approval process for procedures, and to enable prompt payment of claims—even at the point of transaction, Gudla says. “We’ll see partnerships that we have not seen before, particularly between hospitals, between different healthcare IT providers, and between universities and payers,” he predicts.

Vyas foresees health plans “rising to the occasion” to take advantage of Application Programming Interfaces (APIs) that pull from harmonized data to power convenient, consumer-friendly applications. The systems they build will integrate workflows across health plans, providers, and patients to orchestrate activities for everyone participating in a patient's care. “You’re going to see the data from payers coming out of the silos and helping spark these use cases,” he says. “This is a golden era for payers.”

The ultimate goal is to reduce costs for the healthcare industry and for patients. Analyzing large cross sections of historical, clinical, claims, and prescription data with artificial intelligence and machine learning can help health plans better understand the total cost of a patient’s care. “Cost transparency is good for the consumer, obviously, because they have more clarity,” says Kumar, “but it’s also good because it pushes this dynamic in the industry to really be thoughtful about the total cost of care when we’re designing plans for our members.”



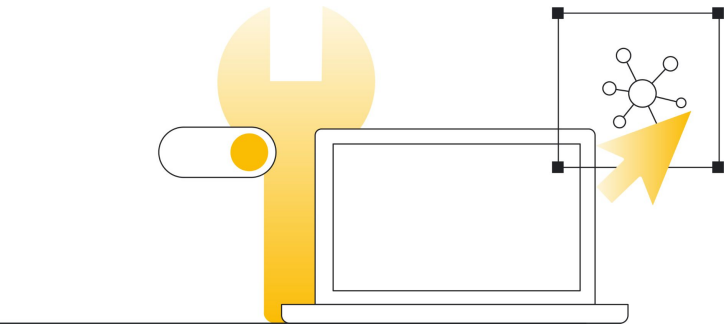
Enabling healthcare innovation

To prepare for the ONC and CMS rules to take effect, health plans are busily digitizing records and workflows, cleaning and normalizing their data, and selecting data sharing platforms. Collaborations like the CARIN Alliance are publishing implementation guides to help them make the many technical implementation decisions required to satisfy the new regulations and ensure patient trust. For example, they must choose mechanisms for authenticating users, securing data access, and getting patient consent.

By mandating that patients have safe and secure access to their healthcare data, the ONC and CMS rules are ushering in a new era of innovation. Health plans see possibilities that go beyond implementing the minimum requirements. They're investing not only to comply with regulations, but also to make the long-awaited vision of improved care at a lower cost real for American consumers, particularly those who are traditionally underserved. When public and private sector goals are in perfect rhythm, great performances will surely follow.

> "We'll see partnerships that we have not seen before, particularly between hospitals, between different healthcare IT providers, and between universities and payers."

Reddi Gudla, Vice President of Digital Technology, Anthem

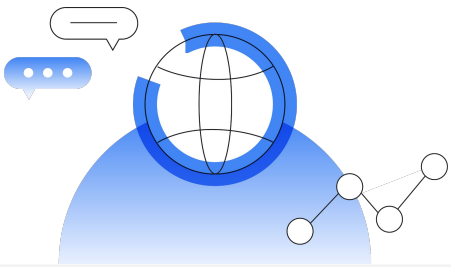


02

Interoperability Quick Wins

How can healthcare organizations quickly demonstrate the value of data interoperability?

Amy Waldron, Director of Healthcare, Google Cloud



“Start by looking at your own data before you try to go outside. Pull your own data out of your own systems. Do you know what you're looking at? Do you measure your payables and your carve outs? Does your revenue cycle team look at those things and do spot audits? Do you also then look internally at your clinical quality and say, ‘Did this make a difference or not?’ From those types of assessments, you can then figure out what data you're missing. **But you first have to answer the right questions. It's got to be real. It's got to be actionable.**”

Aaron Miri, Chief Information Officer, Dell Medical School and UT Health Austin

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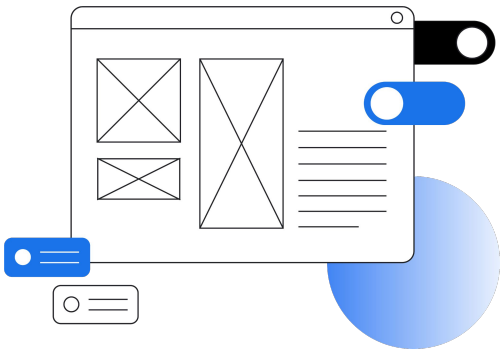
Look for opportunities where you can add value quickly, in which you’re solving real business and operational needs. As new use cases come in, evaluate contemporary cloud-based technologies as the solution and evangelize the incremental value you create inside your organization. When we started, FHIR interoperability was only outward facing, but as it's shown value, it's starting to find its way back into systems that involve clinical workflow and claims processing. So, it's not, ‘Hey, let's turn off the old stuff. Let's turn on the new stuff.’ It's, ‘Let's see how we can co-mingle these things and show value as we're migrating to a contemporary model.’ When the executive business radar starts recognizing the value of what you're doing, then your efforts will spread organically.”

Patrick Murta, Chief Interoperability Architect, Humana



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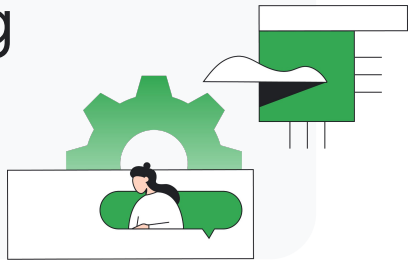
Don't try to boil the ocean. Think about where there are huge discrepancies and create a quick win around that. One thing providers struggle with is the number of patients burdened with providing their own health information when seeking care. Believe it or not, only about half of hospitals can electronically search for critical health information from outside sources such as emergency visits or office visits. So there’s huge opportunity there.”

Dr. Esteban Lopez, Healthcare and Life Sciences Market Lead, Google Cloud

03

Democratizing Data and Humanizing Healthcare: Lessons from COVID-19



Propelled by COVID-19, healthcare organizations have fast-tracked cloud-based innovations to help them deliver targeted, timely care to patients who need it most. Data-driven, human-centric collaboration is upending traditional business models, with positive implications for long-term population health.

The onslaught of COVID-19 exacerbated long-standing weaknesses in healthcare. "Half the population around the world does not have access to some of the basic healthcare necessities," says Amy Waldron, Director of Healthcare at Google Cloud. In the United States, where some 30 million people are uninsured, social determinants like income, race, and location create barriers even for those with coverage. "Not only does this put a lot of cost pressure on the system, but it also directly impacts quality of care for many people in our communities," Waldron says.

The healthcare industry has been challenged to provide the types of data-driven technology experiences that have revolutionized other industries, such as retail shopping and finance, because measures to protect private health information have made it difficult to move past legacy systems that keep data locked in silos, stored in incompatible formats.

"We've allowed rigor around compliance to hold this industry back," asserts Heather Cox, Chief Digital Health and Analytics Officer for Humana.

> "COVID-19 has brought about new forms of collaboration and innovation we never could have imagined."

Amy Waldron, Director of Healthcare, Google Cloud

Disconnected data not only prevents individual patients from getting a full picture of their own health, but it also makes tracking public health trends much more challenging. While the healthcare industry has been aware of these challenges for some time, it took a crisis—the COVID-19 pandemic—to drive home the importance of removing barriers around data.

Understanding the immediate needs of the community

Cleaning, normalizing, and organizing disconnected datasets—and then integrating them—provides a more complete picture of both individual patients and their expanded communities. Although many healthcare organizations were already planning such work, baby steps became leaps forward as COVID-19 stretched resources beyond capacity.

Faced with unpredictable waves of illness and hospitalizations due to COVID-19—on top of patient needs unrelated to the pandemic—health plans and providers alike accelerated their data interoperability efforts, converting disparate data sources into standard formats like Fast Healthcare Interoperability Resources (FHIR). Applying cloud analytics to integrated data not only helped them to optimize care for patients suffering from COVID-19, but also to understand what support other patients in the community might need.

Humana, for example, created real-time dashboards to help manage resources across regions and closely monitor their membership base during the pandemic. "With advanced analytics models, we targeted members with chronic conditions to make sure they were taking care of themselves," Cox explains. Through such efforts, Humana discovered that some members staying isolated to protect their health ended up feeling lonely or depressed.

Humana connected these members with mental health specialists. They also delivered nearly a million meals to people they learned were experiencing food insecurity.

"This combination of digital and human—from physical to digital, and from digital back to physical—has been really powerful for us during COVID," Cox says. "Creating the insights you need in the moments you need them is a really powerful place to be."

> **Creating the insights you need in the moments you need them is a really powerful place to be."**

Heather Cox, Chief Digital Health and Analytics Officer, Humana

Sharing data to gain a better view of public health

While analyzing its data can help an organization like Humana design special programs for its constituents, analyzing data across multiple organizations serving the same community
can help public officials and healthcare organizations understand what resources are needed where and when, as well as which treatment paths may be most effective for specific individuals.

HCA's chief data officer, Dr. Edmund Jackson, is leading the effort to derive clinical, operational, and financial insights from the vast sources of internal and external data now available because of COVID-19. "We're using data to gain insights, and not just for those in positions of privilege," he says. "Ensuring the data is democratized and everybody can see what's happening is a key outcome for us."

In this spirit, HCA worked with Google Cloud and SADA Systems to build the National Response Portal, which melds thousands of public and private data sources into a visual mosaic of historical trends, forecasts, and real-time infection rates at the local and national level. "The real idea there was to create a Google map, initially for COVID, to enable anybody within the country to understand what the situation was in their local community," Jackson explains.

Designing future business models

The National Response Portal, Waldron says, is a prime example of both harnessing the power of data in the midst of a crisis and of stepping outside competitive boundaries to collaborate for the public good, a type of collaboration that depends on the ability—and the willingness—to share data. "COVID-19 has brought about new forms of collaboration and innovation we never could have imagined," affirms Waldron. After all, during a global pandemic, healthcare organizations must put human needs above all, even if that means upending traditional business operations. "Maybe some business models need to be disrupted," she concludes.

In hopes of enabling innovation, including new business models, the healthcare industry is now working diligently to overcome technical and organizational barriers to sharing data. "We've got to have standards by which we can communicate," Jackson emphasizes. "We have a tremendous effort now around data governance, data mastering, reference data management within our own organization, so the various different technologies can hold hands within our wall. Getting that right, where we can then exchange data externally, is absolutely critical."

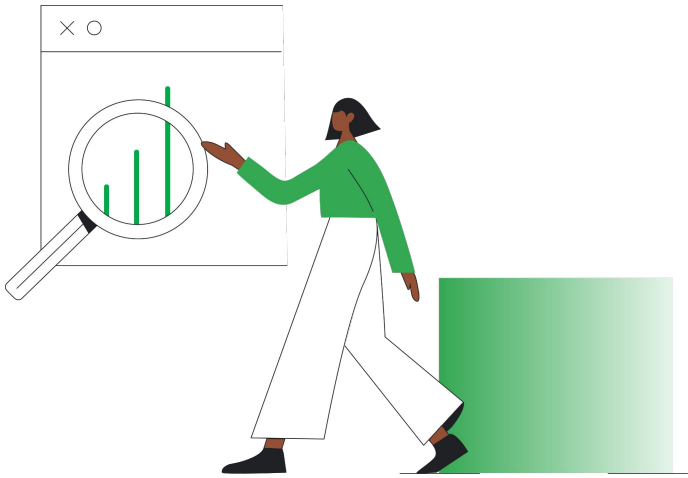
Cox agrees. “Every one of us jumping on the FHIR bandwagon would be a wonderful outcome, in making sure that we can move data,” she contends. “We need to figure out new ways to innovate and new ways to create value for members, even if that disrupts current business models.”

Jackson predicts that technologies like data de-identification and encryption will help organizations share data while maintaining legal compliance and upholding their sacred bond with patients not to expose their data. This, in turn, will enable forward-thinking business models, like ones that encourage competitors to become partners.

From following the rules to making a difference

While the Office of the National Coordinator for Health Information Technology (ONC) and the 21st Century Innovations Act empowers consumers with better access to their healthcare data, it also empowers the healthcare industry to make huge strides in population health using data previously hidden within and between organizations. “There are areas where you can just comply and follow the rules, and then there are areas where you can make a massive difference for the communities you serve,” Waldron says.

The COVID-19 pandemic has provided an immediate, large-scale test-case, demonstrating what’s possible when healthcare organizations embrace new technologies and new ways of doing business.



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Dr. Edmund Jackson, Chief Data Officer, HCA Healthcare

04

Closing Data Gaps to Save Lives

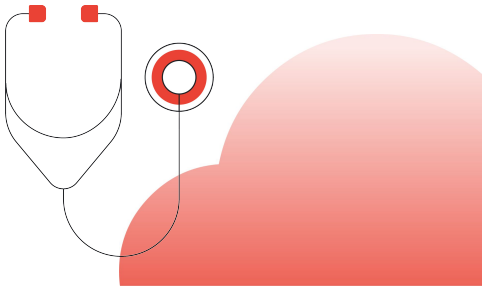
Dealing with the stress and fatigue of coping with illness is challenging enough. Forcing patients or their loved ones to collect, track, and integrate their own healthcare data is inefficient, delays care, and creates information gaps that can be life-threatening. Behind all that data are real human beings. Interoperability makes the crucial connections that can improve and even save their lives.

“We created a cloud-based data lake to create real time dashboarding, which gave our organization the flexibility and agility to respond across our various regions and to monitor our membership base really closely. We also launched our health bot as an AI triage tool to point patients to the appropriate care—whether that was telehealth or a primary care physician—or sending them immediately, if necessary, to an emergency room. The power of those AI-driven tools really helped people take care of themselves.”

Heather Cox, Chief Digital Health and Analytics Officer, Humana

of health systems are highly successful at sharing medical data with payers.

Center for Connected Medicine



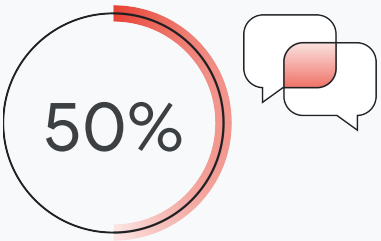
About 1 in 20 individuals

who had been to the doctor last year [2018] reported having to redo a test or procedure because their prior data was unavailable."

The Office of the National Coordinator for Health Information Technology

"To get further through the pandemic and to address other diseases, we'll need to use data in much more sophisticated ways. As daunting as our challenges have been, and as bad as this disease is, the next frontiers are to deal with all the other people who are ill with other kinds of diseases and are also anxious for cures."

Christopher Ross,
Chief Information Officer,
Mayo Clinic



of COVID-19 laboratory reports did not contain the patient's address or ZIP code.

Duke Margolis Center for Health Policy

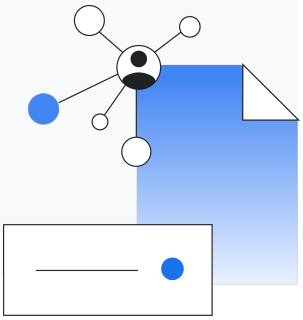
"Making sure that we have searchable data to start making decisions is game-changing in terms of real, life-or-death outcomes."

Dr. Esteban Lopez,
Healthcare and Life Sciences
Market Lead, Google Cloud

Google Cloud

05

Bridging Technology Gaps to Achieve Human-Centric Healthcare



When health plans and providers can securely connect systems and share data, they can treat the whole patient, advancing an essential principle of value-based care.

In a world where personalized apps let us pin locations, autofill passwords, and pay for just about anything with a mere tap on a screen, the healthcare industry can feel outdated. Everyday transactions such as buying groceries and renting cars are intuitive, touch-and-go flows, literally at our fingertips. But what about when it comes to moving ahead with that medical procedure? Enter phone calls and fax machines, and a convoluted, blast-from-the-past maze to pin down an answer for something as basic as pre-authorization.

For many years, large investments in fragmented systems, as well as strict data privacy regulations, have made technology gaps in healthcare hard to close. As a result, doctors and patients are left to coordinate the many parts of individual care on their own. Pre-authorization delays can interrupt consultations, causing frustration for physicians and patients.

And incomplete records are inevitable when patients grappling with illness or injury must collect information from disparate sources and then communicate complex medical histories to multiple caregivers using as many different tools.

Fortunately, hope is on the horizon. The 21st Century Cures Act, which federally mandates new data interoperability standards, requires that health organizations in the U.S. store data in compliant, shareable formats. "Interoperability is one step forward in a journey," says Patrick Murta, chief interoperability architect at Humana. With access to integrated data on administrative transactions such as claims, referrals, and authorizations, systems can deliver technology-driven experiences that connect dots for doctors and patients, saving time and money and improving the quality of care.

Helping Physicians Stay Focused on Patients

“Although prior authorization is certainly necessary, it’s a very burdensome and inefficient process," Murta explains. Before prescribing treatment or scheduling procedures for patients, physicians often have to stop what they're doing to page through one or more web portals, navigate phone trees, or step out to delegate tasks to support staff. At Humana, where data interoperability is a pillar of the company’s “Integrative Care Delivery” model, Murta and his team are employing intelligent systems to reduce such interruptions to the patient care experience.

Using data stored in a patient’s electronic health record, Humana’s system can determine within seconds whether or not a treatment requires prior authorization and if supporting tests like blood work are necessary for approval. “We’re going from a very archaic, out-of-band process which requires a lot of hops, to using contemporary interoperability to keep physicians and their staff directly in their workflow and allowing data to come to them,” Murta reports.

Humana’s proactive approach to interoperability reflects, in Murta’s view, the industry’s shift toward cooperation in the interest of better experiences—and, ultimately, better care—as well as improved efficiency.

“We recognize that value-based care is only achieved when we have nice cohesive interoperability,” he says. “The fact that organizations have been proactive and starting to implement this is a really good symbol for the industry.”

> “We’re going from a very archaic, out-of-band process which requires a lot of hops, to using contemporary interoperability to keep physicians and their staff directly in their workflow.”

Patrick Murta,
Chief Interoperability Architect, Humana

A Pathway to Patient-Centric Care

Data interoperability will break down walls within provider and health plan organizations, but also across every healthcare entity that interacts with an individual patient. “I’ve seen so many patients in the emergency department who’d been across the street, potentially 12 hours earlier, getting CT scans and a full set of labs, and yet I have no access to the results,” says Dr. Esteban Lopez, a practicing physician and the market lead for healthcare and life sciences at Google Cloud. “Either it's going to take me four or five hours to get that information so that I can act on it, or I'm going to have to repeat everything in order to obtain the information so I can treat the patient.”

Patients, providers, and health plans alike suffer when they can’t get a full picture of each patient without manual assembly of piecemeal records. Securely connecting systems and sharing data automatically is necessary for treating the whole person, an essential principle of value-based care.

“Patient-centric care requires a number of dimensions,” says Aaron Miri, chief information officer for Dell Medical School and UT Health Austin. “One is data, two is making sure you actually understand what the unique needs are of the patient, and number three is being able to seamlessly exchange that data among a variety of data sources, data types, and other partners in the community to get a complete picture, 360 degrees, of what's going on.”

> “I’ve seen so many patients in the emergency department who’d been across the street, potentially 12 hours earlier, getting CT scans and a full set of labs, and yet I have no access to the results.”

Dr. Esteban Lopez,
Market Lead for Healthcare and Life Sciences, Google Cloud

In the patient-centric model that the University of Texas at Austin's Dell Medical School is pioneering, patient care teams are in constant communication. They make necessary adjustments to care plans based on diagnostic results and patient responses to ongoing surveys about their experience, including their mental wellbeing. "This is a continuous sampling to understand exactly what is actually going on with the patient pre, during, and post discharge," Miri says. "Payers are very interested in this information because what it's telling you is are you actually healing the total patient or are you just taking care of the issue and then moving on with life?"

Dell Medical School has even designed their hospital to facilitate this vision of patient-centric care, with small meeting spaces placed outside of patient rooms where care teams can huddle to exchange information and ideas. To take care of the total patient, Miri says, every discipline reviews every set of data so they can assign care teams based on each patient's specific needs. For example, a patient facing surgery may need a mental coach in addition to an orthopedic specialist if their surveys indicate depression. "This data then is discretely available—and available to our care providers immediately at the point of care," explains Miri.

A Clear View into the Future

Interoperability lays a necessary foundation for healthcare that truly revolves around the patient. While data may still reside in multiple systems that formerly couldn't "talk" to each other, tools that automate data integration can enable providers, patients, and health plans to collaborate without jumping through hoops to bridge technology gaps by hand. Data sharing enables new care models like those emerging at Humana and Dell Medical School.

"It was unthinkable ten to fifteen years ago that payers, providers and others would come together and actually agree on use cases and how to solve use cases using standards-based technology," Lopez marvels.

Miri agrees. "Having the right data in the right place at the right time is a key differentiator," he says. "It's amazing when you bring transparency and a level of data provenance and a data dashboard layer—everyone can see what's going on."

> Payers are very interested in this information because what it's telling you is are you actually healing the total patient or are you just taking care of the issue and then moving on with life?"

Aaron Miri, Chief Information Officer, Dell Medical School and UT Health Austin

06

Moving to the Cloud Strengthens Security, Privacy, and Compliance

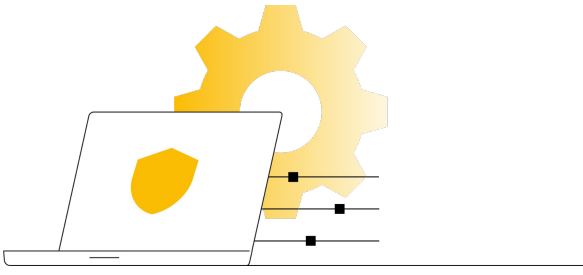
At Google, we know that data is critical to improving patient outcomes and population health at large, as well as highlighting care disparities and inequities. Effective data sharing, analysis, and use allows organizations across the healthcare landscape to think big and to innovate. Effective interoperability helps speed and coordinate patient care, making laboratory results more readily available, and allowing clinicians to make better-informed decisions and deliver focused interventions.

But none of this is possible unless patients, providers, and other stakeholders are willing to share data. Fortunately, moving data to Google Cloud not only makes data interoperability easier to achieve, it also makes data more secure. Google Cloud treats sensitive clinical data with the utmost care, only using it to support delivery of contracted services, while security measures and third-party audits ensure transparency.

Google underpins security, privacy, and trust with services that control data access, remove personally identifiable information, and manage consent. Instead of building these mechanisms on their own, healthcare and life sciences organizations can focus on patient care—and expand the boundaries of what's possible and achievable—through optimal, privacy-preserving use of health data.

> "Google Cloud helps organizations meet their privacy compliance requirements by removing personally identifying information from data without deleting the research value of the dataset in the process, an important aspect of several privacy regulations, including HIPAA."

Christopher Ross, Chief Information Officer, Mayo Clinic



Learn more about our privacy commitments on our website.

Google Cloud

Google Cloud Privacy Principles

Your privacy is our priority

1

You control your data

Customer data is your data, not Google's. We only process your data according to your agreement(s).

2

We never use your data for ads targeting

We do not process your customer data to create ads profiles or improve Google Ads products.

3

We are transparent about data collection and use

We're committed to transparency, compliance with regulations like the GDPR, and privacy best practices.

4

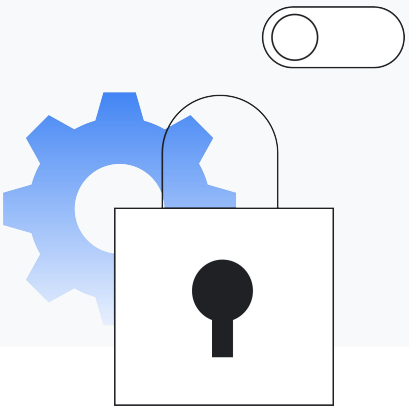
We never sell customer data or service data

We never sell customer data or service data to third parties.

5

Security and privacy are primary design criteria for all of our products

Prioritizing the privacy of our customers means protecting the data you trust us with. We build the strongest security technologies into our products.



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Thank You

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