Microsoft

Breaking down AI:

Real applications in healthcare

Contents

01

The healthcare opportunity: AI and your data

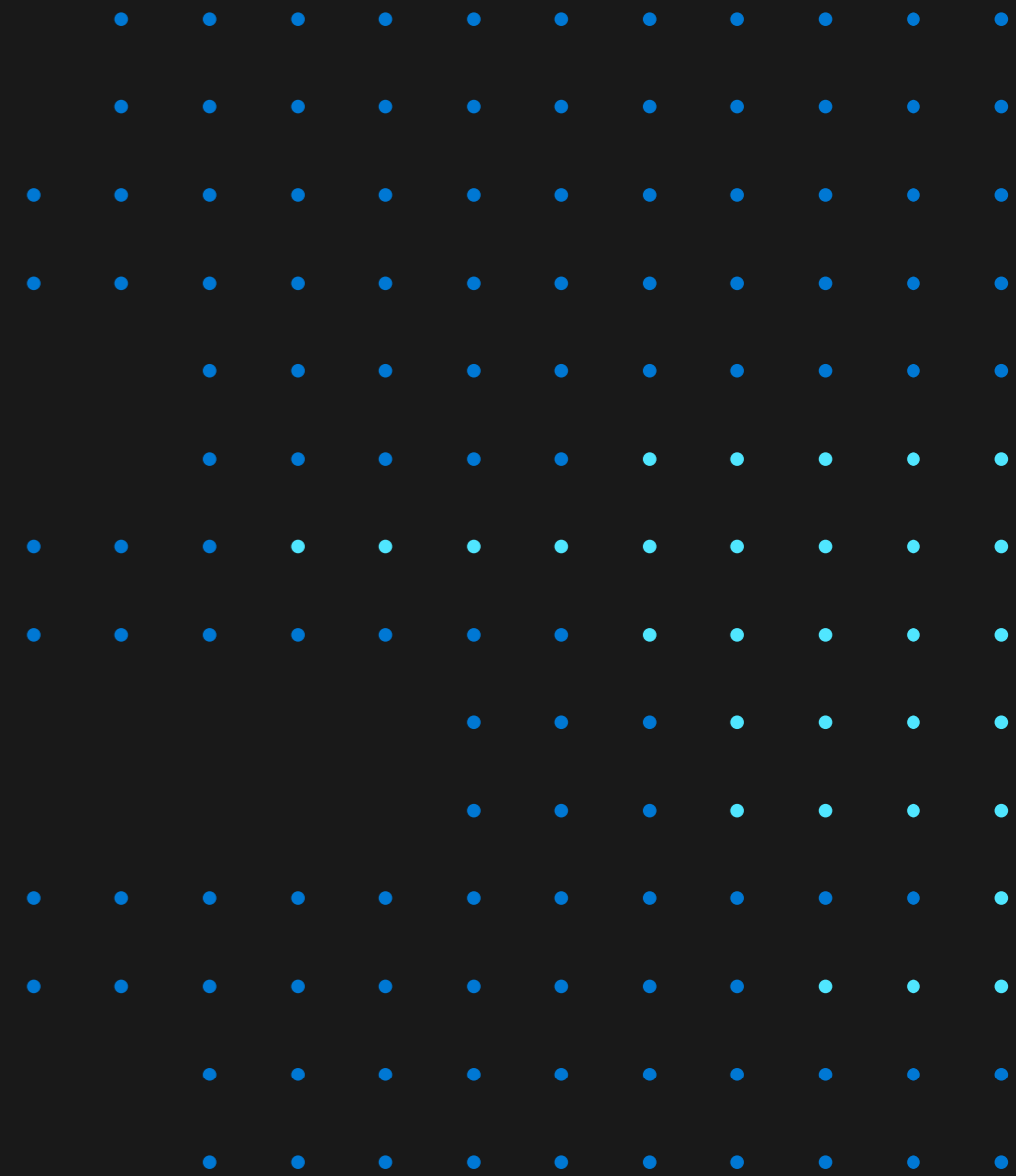# AI and the cloud: Overcoming obstacles with innovation

The healthcare industry faces unique challenges.

Digital transformation and artificial intelligence (AI) have redefined the way health organizations approach patient engagement, care team collaboration, and virtual health. Healthcare frontline workers have had to meet significant challenges in order to best serve patients and adapt to a rapidly evolving industry.

Patients now have increased expectations, but more of them are coming up against the hard reality of an industry-wide staffing shortage resulting in less-than-ideal patient experiences. Even as doctors, nurses, and healthcare workers rise to deliver compassionate, personalized, quality care, the strain of shouldering the extra workload fuels what some industry experts are calling an epidemic of stress-related burnout.[1]

In response, the healthcare industry is turning increasingly to technology. Patients want the low cost and efficiency of digital solutions, but it's important to remember that they are, first and foremost, human beings. Which means they also expect the warmth and emotional connection that comes with a personal, engaging experience. Collecting, storing, securing, and determining how to effectively use the patient data needed to deliver this experience is an urgent priority for the industry, and a problem that has been largely unsolved—until now.
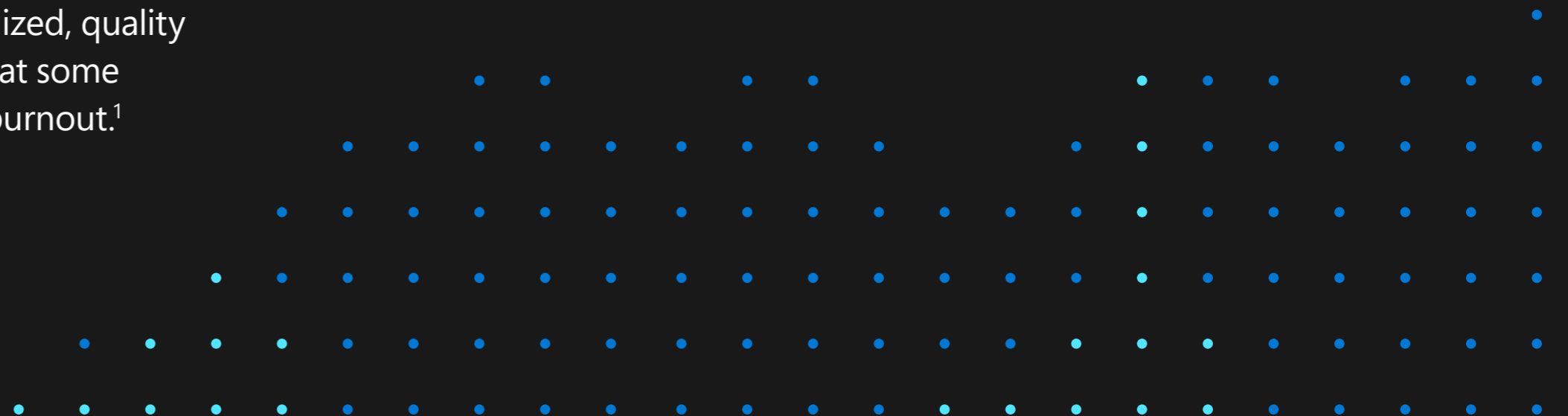
AI and machine learning are transforming the way healthcare is delivered.

Healthcare organizations have accumulated vast amounts of data in the form of electronic healthcare records, clinical research, diagnostic images, population data, and claims data. By leveraging AI to analyze this data and uncover insights, healthcare organizations can make better operational and clinical decisions, improving the quality of experiences they provide.

AI and the cloud are the gateway to digital transformation, and organizations around the world have come to recognize AI as the transformative technology that will enable them to gain real business advantage. AI's ability to process vast quantities of data allows those who implement it to uncover deep business insights, augment human expertise, drive operational efficiency, transform their products/services, and better serve their customers.

We are experiencing digital transformation at a scale never seen before, with progress that would previously have taken years now being made in mere months. With Microsoft's acquisition of Nuance Communications, we now offer a powerful combination of best-in-class AI that is built on years of domain intelligence and expertise across multiple verticals with planet-scale cloud infrastructure.

Nuance will help organizations achieve more by accelerating business outcomes, solving industry's biggest challenges, and amplifying impact. Nuance shares a passion for ensuring that people everywhere, and the organizations they serve, are benefiting from the latest advances in digital technology.

Microsoft Cloud for Healthcare enables seamless digital transformation

Microsoft Cloud for Healthcare provides the capabilities to manage health data at scale and makes it easier for healthcare organizations to use data to improve the patient experience, coordinate care, and drive operational efficiency while helping support security, compliance, and the interoperability of health data.

→ **Improve business outcomes with Microsoft Cloud for Healthcare**

50% higher ROI

Preemptive digital transformations have a 50 percent higher ROI than reactive ones.[2]
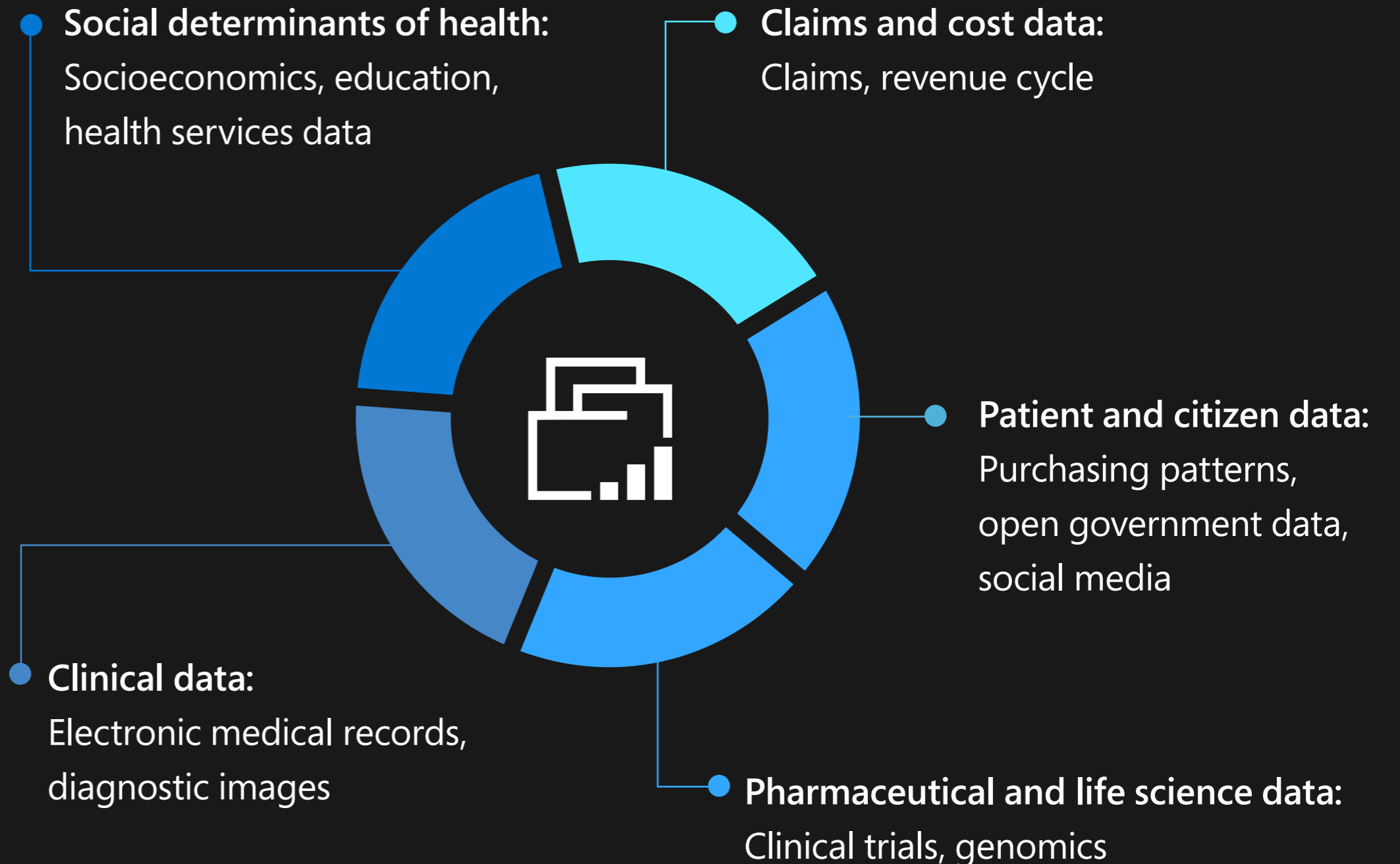
Advanced analytics opportunities

New systems of insight are the next evolution of digital transformation. By taking advantage of advances in intelligent healthcare, organizations can dramatically improve business outcomes.

Microsoft Cloud for Healthcare enhances patient engagement.

See how Microsoft Cloud for Healthcare helps you provide a modern patient experience >

AI enables deeper insights by providing richer data analysis:

Social determinants of health: Socioeconomics, education, health services data

Claims and cost data: Claims, revenue cycle

Patient and citizen data: Purchasing patterns, open government data, social media

Clinical data: Electronic medical records, diagnostic images

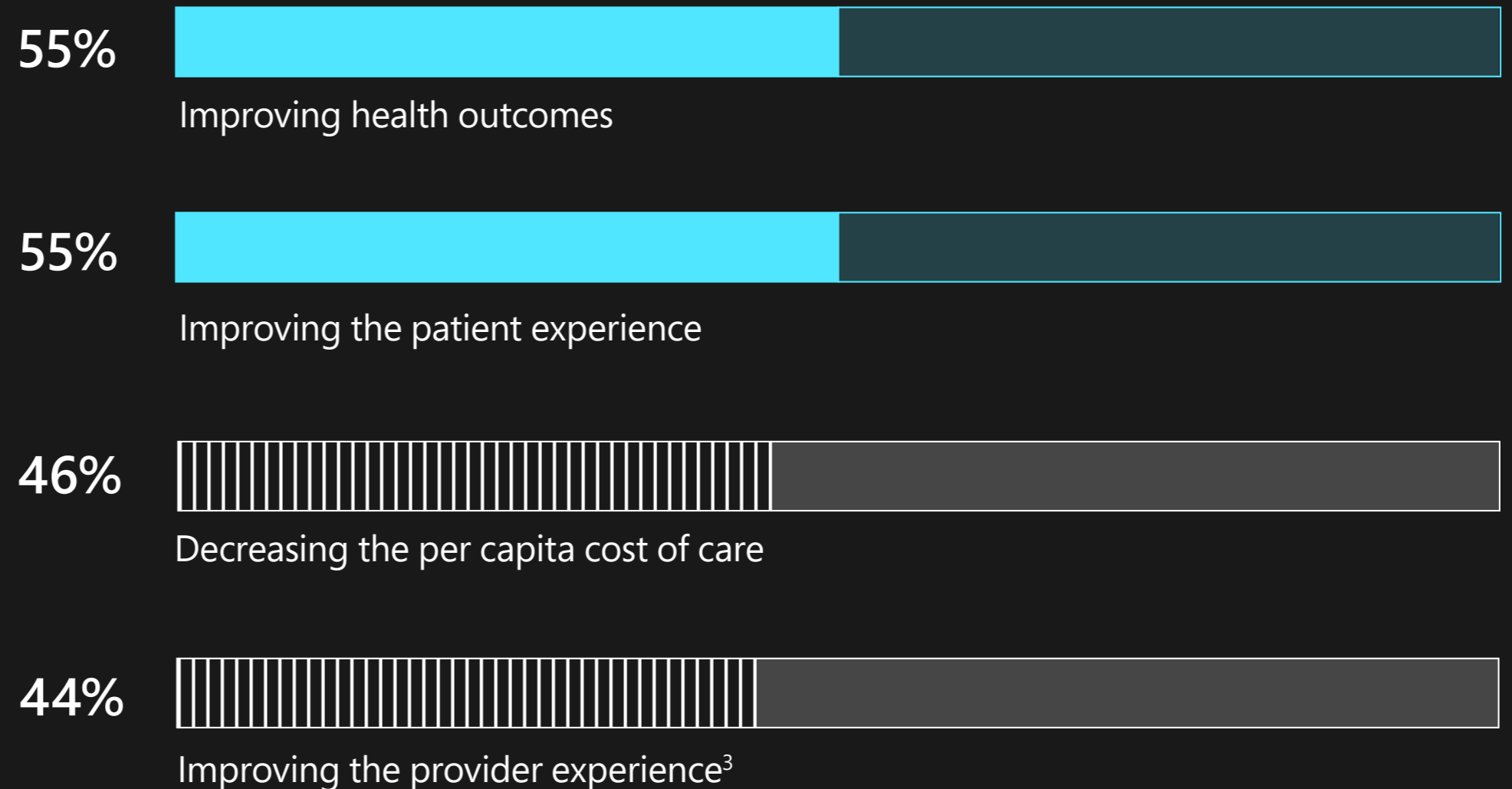**Pharmaceutical and life science data:** Clinical trials, genomics

A new paradigm for better patient care

Organizations have discovered the foundational need for AI. And while the AI market is predicted to reach nearly $1 trillion by 2028[2], the reality is that practical applications of AI are already meeting the needs of healthcare professionals.

AI will improve healthcare outcomes across the board, particularly for consumers.

According to a survey of healthcare executives, AI will have the greatest impact in these areas:

55% Improving health outcomes

55% Improving the patient experience

46% Decreasing the per capita cost of care

44% Improving the provider experience[3]

Consumer-facing benefits   Business/operations-focused benefits

AI and real-time data are creating a new paradigm for healthcare

Data and AI are enabling a more predictive and prescriptive analytical approach to healthcare. In practical terms, this means that AI is providing the capability to sense the healthcare world, comprehend, act, and learn. AI uses machine learning and delivers capabilities to mimic human types of behavior and performance—ultimately improving patient care and outcomes. AI systems gather and crunch massive amounts of data in real time to identify patterns. They then use that information to automate and streamline healthcare processes.

Current AI capabilities include:

Predicting the future condition of individual patients based on early warning signs.
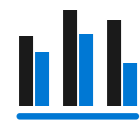
Determining best practices in operations management by comparing data from multiple facilities.
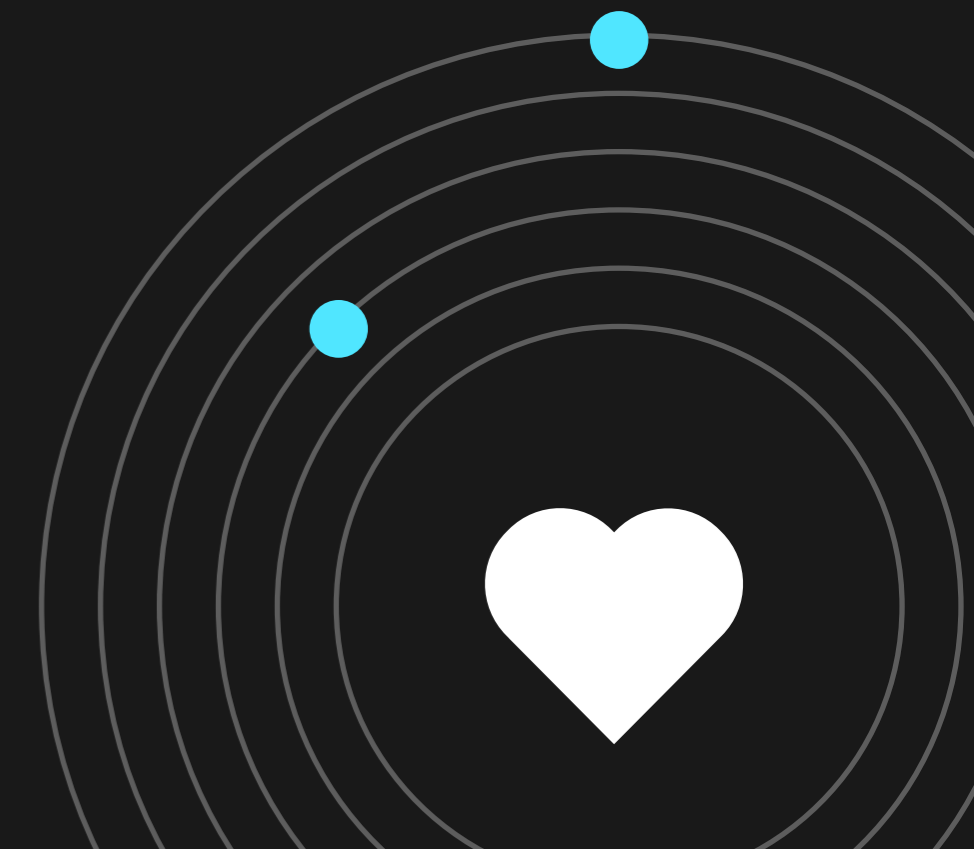
Recommending medications based on the successful treatment of similar patients.

Detecting and preventing fraudulent claims or other abuses.

Healthcare leaders can take advantage of AI tools to empower care teams, engage patients, optimize clinical and operational effectiveness, and ultimately transform healthcare.

02

How does AI lead to better care?

AI enables a broad spectrum of healthcare advances

It's important to enable AI for everyone in the care process and understand the significant opportunities that exist. Transformation based on data and AI is delivering clinical operational analytics solutions that can improve the quality of care for patients throughout their care experiences.

Let's see how
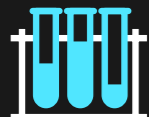
Clinical analytics focuses on the use of data and analytics to improve clinical treatment processes and outcomes.

For example, clinicians can pull insights from data to help identify at-risk patients and deliver optimal treatments. Sophisticated analytics engines—enhanced through machine learning and AI—can provide evidence to inform actions.

Operational analytics focuses on the use of data and analytics to improve the efficiency or effectiveness of systems used to provide and manage care processes.

Using AI, healthcare teams can automatically capture documentation at the point of care, freeing clinicians to focus on their patients. AI can also help teams predict operational issues, track safety metrics, monitor equipment inventory, maintain the integrity of the supply chain, and identify opportunities to improve process efficiency.

Following are some scenarios in which AI is already delivering value. They exemplify opportunities to improve both clinical quality and operational effectiveness in healthcare organizations.
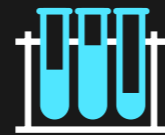
Clinical analytics

Transform data into prescriptive insights.

- Predictive care guidance

- Behavioral analytics

- Population health

- Medical health records

- Medical imaging

- Virtual health

Operational analytics

Gain actionable insights to optimize performance.

- Readmissions management

- Cost management

- Claims management

- Staffing management

- Throughput management

How the latest in AI allows you to build your future

Patients have always appreciated a personal touch. Doctors are admired for their "bedside manner." Nurses are cherished for their capacity for compassion. But in our current era of near-instant gratification, people seeking healthcare have come to think like consumers: **they expect the highest level of personalized care whenever they want it, wherever they are.**

It's important to understand the difficulty modern healthcare faces in delivering this level of care—anytime from anywhere. As mentioned earlier, the healthcare industry, as a whole, is experiencing extremely high rates of clinician burnout.

Aside from the personal cost to the wellbeing of healthcare workers themselves, the reality is that as clinicians burn out, their capacity to provide quality care deteriorates.

Crucial details are misheard or simply missed altogether; paperwork is not completed in a timely manner. When specifics fall through the cracks, the result can be a needless delay in disease detection, or even a complete misdiagnosis.

For healthcare leaders to prepare for a resilient future—while meeting the modern patient's expectations—the use of AI-powered technologies is imperative. Healthcare leaders now need to find trustworthy, ethical AI partners who understand the complexities of applying AI to an industry that has made HIPAA compliance the gold standard in data protection and privacy.

SPOTLIGHT: MICROSOFT AND NUANCE

With powerful and robust AI backed by decades of domain expertise, coupled with the scale, security, and power of the Microsoft Cloud, Nuance has the opportunity to put advanced AI solutions into the hands of professionals everywhere, driving better decision making, creating more meaningful connections, and producing tangible outcomes.

Microsoft Cloud for Healthcare*

Provides trusted, integrated capabilities that make it easier to create personalized patient experiences. These capabilities also give clinicians connected tools and help them adopt important healthcare data standards.

Nuance Dragon Medical One**

The #1 rated conversational AI workflow assistant and documentation companion enables every clinician to automate the tasks that hold them back and create documentation—using just their voice—in all clinical settings.

Nuance Dragon Ambient eXperience (DAX)***

Extends the power of Dragon Medical One, dramatically reduces clinicians' administrative workloads, improves the quality of their clinical documentation, and enhances patient experiences and outcomes.

*Microsoft Cloud for Healthcare international availability can be found at: International availability of Microsoft Cloud for Healthcare | Microsoft Docs

**Nuance Dragon Medical One is available in the following countries: Australia, Austria, Belgium, Canada, France, Germany, Ireland, Luxembourg, Netherlands, Spain, New Zealand, United Kingdom, and United States.

***Nuance Dragon Ambient eXperience is available in United States only.

By helping healthcare organizations improve their quality of care, we can help make physician and patient experiences more personal, more engaging, and most importantly, more accurate. Our solutions also assist in generating appropriate reimbursement and reducing operational costs to organizations, which in turn improves financial outcomes.
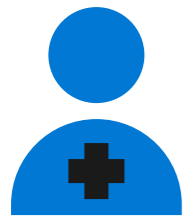
Nuance solutions are used by more than 55% of physicians and 75% of radiologists in the U.S.[4]

77% of U.S. hospitals currently use at least one Nuance solution.[4]

Learn more about Nuance ❯

"Before Dragon, I would spend anywhere from three to six hours on a Sunday, reviewing, editing, and signing numerous charts that took away family time. Dragon changed that for me, and I am grateful."

—Dr. Michael Greene,
Peachtree Spine Physicians

"Nuance DAX is a prime example of how we are using innovation to deliver excellent patient experiences and improve provider satisfaction with technology that allows providers to focus on patient care."

—Craig Richardville,
Senior Vice President and Chief Information Officer,
Intermountain Healthcare

03

Clinical analytics in healthcare

86%

of healthcare costs are attributable to chronic disease.[5]

Predictive care guidance

Start with these questions

Do you use analytical systems that help clinicians predict the effectiveness of treatments?

If so, in which areas are you applying predictive care guidance?

If not, are there areas within the provision of care in which you would find such systems especially useful?

Key benefits

For providers:

Clinical pathway prediction

Drug effectiveness

Disease progression prediction

For payors:

Health risk prediction

Predictive risk scoring

What is predictive care guidance?

Predictive care guidance uses analytical solutions to search through large amounts of data from sources like electronic medical records, smart medical devices, patient and population demographics, and the public domain to find hidden patterns and trends and predict outcomes for individual patients. Most predictive care guidance relies on AI learning models that become more precise when additional data and cases are introduced.

Predictive analytics is a data-driven crystal ball that's taking analytics to the next level—beyond descriptive or diagnostic methods that look back at what happened and why.

How can it help your organization?

Predictive care guidance enables clinicians to determine the likelihood of disease and helps with determining diagnoses and predicting future wellness or illness. Predictive guidance can improve the quality of healthcare and reduce the costs of care. It provides clinicians with answers they're seeking for individual patients, with a focus on increasing the accuracy of diagnoses.

Benefits of implementing analytical models

For providers

- **Clinical pathway prediction.** Assess and predict which treatment option will likely produce the best outcome for a patient.

- **Drug effectiveness.** Predict which drug will produce the best outcome for a patient.

- **Disease progression prediction.** Predict the likely path and progression of a disease.

For payors

- **Health risk prediction.** Predict the likelihood that a patient presenting a certain set of symptoms is at risk for an adverse health event.

- **Predictive risk scoring.** Assess which patients might be at risk for readmissions and hospital-acquired infections.

57% of organizations in the late stages of AI deployment believe they'll see savings in as soon as two years.[6]

Behavioral analytics

💬 Start with these questions

How well do your care providers and care recipients conform to recommended care protocols?

Does your organization use value-based payment systems, in which quality or outcome measures affect your reimbursements?

›› Key benefits

For providers:

Patient engagement

Readmissions

For payors:

Individual health and wellbeing

What is behavioral analytics?

Behavioral analytics is a term used in marketing to describe the analysis of consumer behavior patterns that informs how to market or deliver an action in a way that increases the odds of adoption. While clinical analytics can recommend a clinical action, applying behavioral analytics increases the likelihood of the action being taken. This is sometimes called nudging the patient or care provider.

Other industries use behavioral analytics to suggest add-on sales or display content based on previous usage patterns. This is how Netflix recommends movies that a customer might like. The method of deriving suggestions is particularly important in healthcare because suggestions will be put off or ignored if they're not easy to implement.

How can it help your organization?

Incomplete application of evidence-based medicine is a leading cause of poor outcomes and an increased overall cost of care. Behavioral analytics can increase the adoption of recommended practices.

Benefits of behavioral analytics

For providers

- **Patient engagement.** Engage patients and care providers to ensure conformity and increase the likelihood of the best possible care.

- **Readmissions.** Reduce readmissions and even prevent initial admissions through proactive targeting.

For payors

- **Individual health and wellbeing.** Improve health awareness and preventive care choices in patients.

CASE STUDY: BEHAVIORAL ANALYTICS IN ACTION

Walgreens Boots Alliance incorporated the Azure Health Bot service to reassure consumers by putting the facts at their fingertips

When an unprecedented healthcare crisis struck, Walgreens Boots Alliance wanted to provide its customers with quick, accessible information. The global pharmacy organization knew that reliable information and facts provided reassurance in an uncertain time. By partnering with Microsoft, the organization was able to find a way to provide that real-time information without straining its already burdened staff. By implementing bot technology, Walgreens Boots Alliance made it easy for customers to access healthcare resources directly. This left pharmacists and staff free to focus on other critical tasks and personalized customer service.

Read how Walgreens Boots Alliance used automation to provide quicker answers ⟩

Are you feeling sick?

Yes.

In the last 10 days, have you lost your sense of taste or smell?
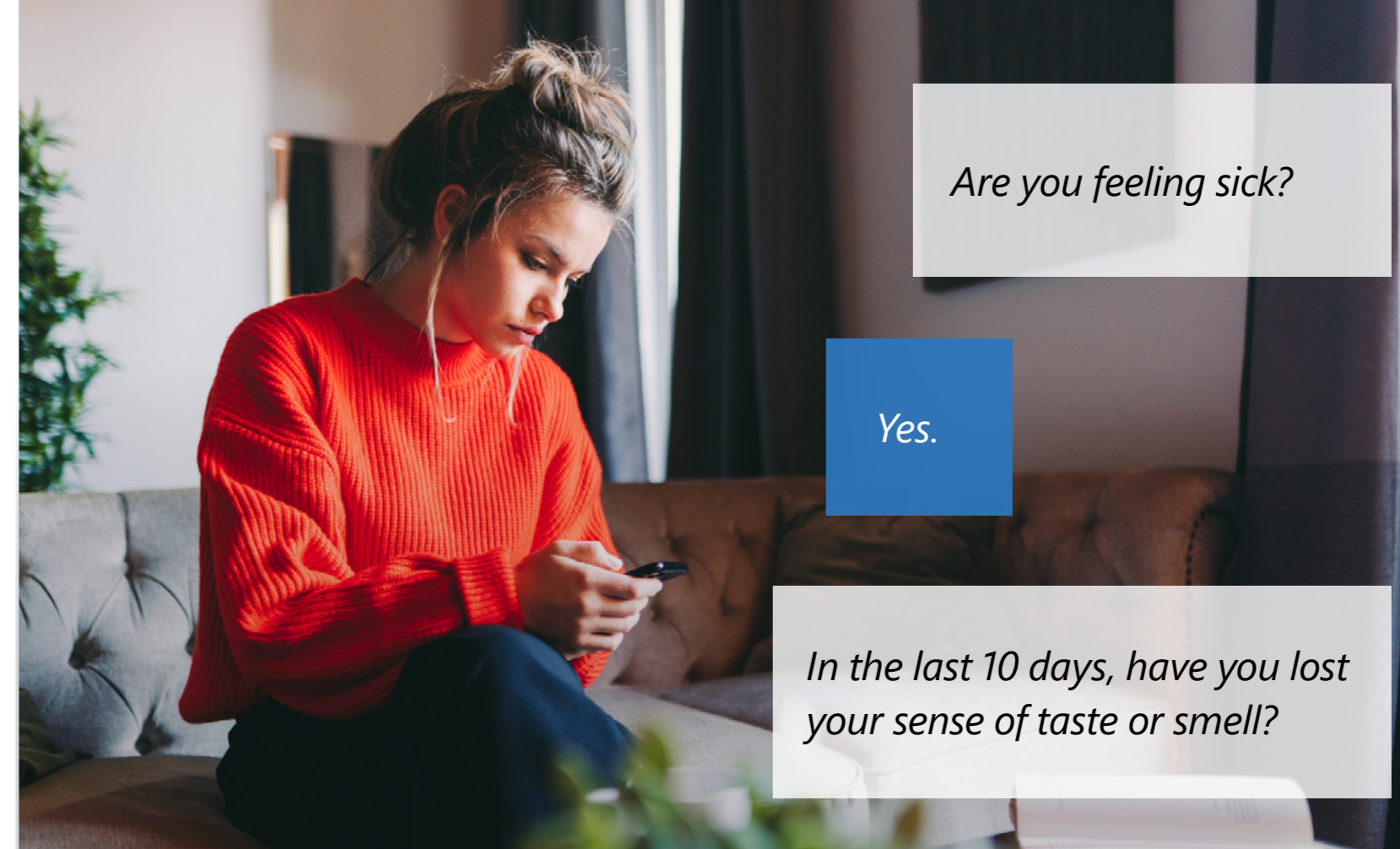
"It's been fantastic to see how the [Azure Health Bot] service has helped us do the right things for our customers and, just as importantly, for our medical service providers."

—Greg Orr,
Vice President of Digital Health, Walgreens Boots Alliance

Population health

Start with these questions

Which of your patient populations consumes the most resources?

Is your organization using value-based payment systems, in which quality or outcome measures affect your reimbursements?

Key benefits

For providers:

Integrated care

Specialty care

Patient engagement

For payors:

Cost management

Self-care management

What is population health?

Population health strives to influence the delivery of care to a group of individuals who have similar healthcare needs, as opposed to focusing on evaluating and treating medical conditions one patient at a time.

How can it help your organization?

Payment systems are moving from a fee-for-service business model to one that incorporates value into the payment equation. Meeting payor requirements during this transition requires greater use of data and analytics, including better data on patient-reported outcomes, social determinants of health, patient and member risk stratification, and activity-based costing.

Benefits of implementing population health

For providers

- **Integrated care.** Implement integrated care—coordinated treatment across care team members, including clinicians, social workers, physical therapists, and behavioral healthcare professionals. Analytics can help identify and measure the effectiveness of care across all care settings.

- **Specialty care.** Use data to determine the best ways to manage health needs and outcomes for entire populations of people suffering from chronic conditions.

- **Patient engagement**. Empower patients to more effectively manage their own health and participate in the decision-making process to improve outcomes.

For payors

- **Self-care management.** Use patient data to improve patients' understanding of their role in their wellness, help them stay healthier, and reduce the cost per service.

- **Cost management.** Manage the health of populations by creating better outcomes at an efficient cost.

How Finnish healthcare provider HUS created a life-saving system with Microsoft Cloud for Healthcare

Finland's largest healthcare provider, HUS, has created a test, track, and trace system that combats the spread of infectious viruses such as COVID-19.

Using a variety of services from Microsoft Cloud for Healthcare, the system directs Finnish citizens to a health bot for self-assessment, helps them book a test, sends them the results, and contacts those who may have been infected. The data that is collected and used to power the system is compliant with Finnish security and privacy legislation and is informing research efforts to understand how viruses are contracted and how they spread.

Learn more about how HUS is pioneering new testing 〉

"The key is having all these services as part of Microsoft Cloud for Healthcare, and therefore natively interoperating. So, we can think of them as different tools from a magic toolbox."

—Aki Puustjärvi,
IT Development Manager, HUS

Medical imaging intelligence

Start with these questions

Are you (or your imaging partners) doing anything to embed analytics or intelligence into the medical imaging process?

What type of analytics are you using to evaluate the effectiveness of your imaging systems?

Would you like to create a longitudinal view of a patient during diagnosis and close the feedback loop for improved learning and future diagnosis?

Key benefits

For providers:

Diagnosis and treatment optimization

Creating cohorts for clinical research

For payors:

Speed and quality

What is medical imaging intelligence?

Medical image intelligence is the embedding of analytical capabilities into medical images to augment or improve diagnostic and treatment planning processes.

How can it help your organization?

Medical images represent one of the largest categories of unstructured data used in healthcare.

Specialists like radiologists, oncologists, ophthalmologists, and others are trained to evaluate medical images to assess medical conditions, make diagnoses, and deliver treatments based on their reading of these images. Analytics technologies can increase the effectiveness of these efforts.

Benefits of implementing medical image intelligence

For providers

- **Diagnosis and treatment optimization.** Assist specialists in making diagnoses and improving treatment planning, increasing the efficiency of these processes.

For payors

- **Speed and quality.** Improve the quality of image analysis while driving down costs for payors.

Microsoft Cloud for Healthcare can help you unlock insights.

See how Microsoft Cloud for Healthcare enables treatment optimization ⟩

Medical imaging intelligence in action

Alder Hey Children's Hospital has been caring for sick children and their families for over a century. As one of Europe's largest and busiest children's hospitals, they treat more than 300,000 young patients every year, so when the COVID-19 pandemic first hit, they faced a staggering dilemma: How do you treat a child who desperately needs complex heart surgery, when you know he has COVID-19? How do you protect your doctors, nurses, and medical teams from catching one of the world's most contagious diseases? To do this, they turned to the Microsoft HoloLens 2.

Using this technology, medical teams could connect with colleagues—without needing to enter a restricted COVID-19 area—to agree on a change in the clinical strategy for the operation.

Learn how Alder Hey Children's Hospital used HoloLens 2 to save lives 〉

"HoloLens 2 is opening new doors to what we can do in a hospital setting while keeping our patients and staff safe."

—Rafael R. Guerrero,
Clinical Director of Cardiac Services and Director of Innovation, Alder Hey Children's Hospital

Virtual health

Start with these questions

Do you have virtual tools and services that enable clinicians and care teams to access real-time information about a patient's issues, prescriptions, biometrics, vitals, and other clinical information?

Do you have modern digital tools to connect remotely with your patients and engage them in their healthcare journeys?

Key benefits

For providers:

Improved patient outcomes and clinician productivity

Transformed virtual care

Increased patient access to care

For payors:

Improved quality scores

Increased beneficiary satisfaction

What is virtual health?

Virtual health refers to the use of digital healthcare tools to engage health consumers and encourage self-care and peer care, promote remote care coordination and management, and reduce costs.

Examples of virtual technologies include telehealth visits, remote patient monitoring, AI-powered chat bots, interactive voice recognition, and wearable technology, all of which resolve the logistical challenges of hospital wait times and provide proactive care coordination.

How can it help your organization?

A virtual health program helps clinicians make informed diagnoses and recommend treatments that align to patient care coordination plans. By using machine learning and AI, healthcare providers can implement effective home health or remote monitoring programs and make better use of the clinical workforce when monitoring patients remotely. Machine learning algorithms for chatbots can triage symptoms and patient health data to help clinicians make better treatment decisions.

Benefits of implementing telehealth

For providers

- **Improved patient outcomes and clinician productivity.** Use AI and virtual health to reduce the need for physician data entry. Allow patients and clinicians to spend more time interacting with each other to enhance the experience and overall patient-provider relationship.

- **Transformed virtual care.** Transform virtual care by incorporating virtual health technologies and innovative uses of data. Keep patients connected and create better understanding among remote care teams.

- **Increased patient access to care.** Increase your range of coverage and your ability to diagnose medical issues remotely, which helps reduce overcrowding in hospitals.

For payors

- **Improved quality scores.** Improve health outcomes and reduce hospitalizations and readmissions with remote patient monitoring tools supplemented by video- or phone-based consultations with providers. This also directly improves payor quality scores and cuts costs.

- **Increased member satisfaction.** Use virtual health and digital engagement to allow members to better manage their treatment plans. This improves care coordination and member satisfaction and promotes healthy behavior.

- **Increased member access to care.** Offer virtual health benefits to provide your members with quicker access to care when needed, avoiding escalation of sickness and reducing costs.

Austrian mental health provider develops a groundbreaking solution using data and AI to prevent and treat mental illnesses

Patient data has traditionally been used to help doctors and physicians understand and treat patients with existing illnesses. But could this same data be used to prevent an illness from ever developing? Researchers at Anima Mentis have shown it can.

By collecting and analyzing a broad range of biometric, medical, and contextual patient data, the team at Anima Mentis can reliably predict how patients will react to a variety of stressful situations. Using modern AI, they have created an industry-leading solution that offers patients personalized recommendations to help them prepare for any difficult situations that could arise.

Read how Anima Mentis uses data and AI to prevent and treat mental illnesses ❯

"We like to think of our solution as a fitness center for the soul. A gym for the mind that helps not only cure mental illnesses but also, and most importantly, to prevent them."
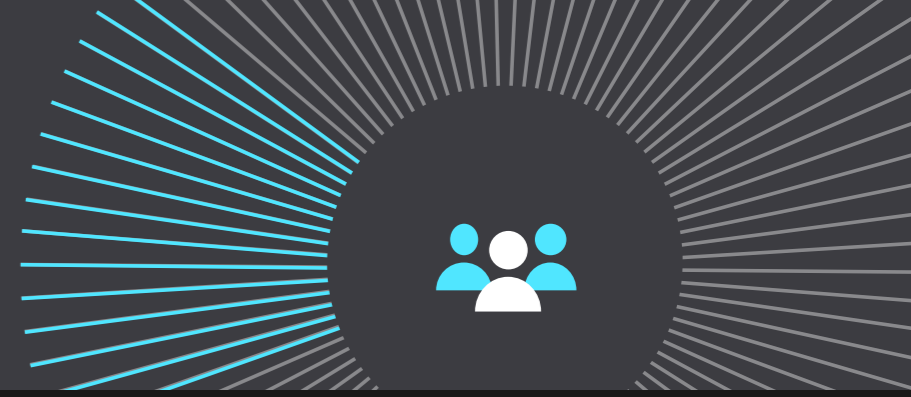
—Dr. Peter Kirschner,
CEO, Anima Mentis

33

04

Operational analytics in healthcare

Staffing management

💬 Start with these questions

What percentage of the total cost of running your organization involves staffing?

How do you determine staffing levels for your nursing units or clinics?

How often do you face overstaffing or understaffing issues?

» Key benefits

For providers:

Improved staff retention

Staff training

Staffing level assessment

What is staffing management?

Staffing management is the process of modeling and predicting optimal staffing levels based on factors like predicted patient volume and the type and complexity of patients being treated.

How can it help your organization?

During a pandemic, proper staff allocation is a key way to prevent physician burnout. Physician wellbeing is becoming a critical issue as unprecedented numbers of patients flood hospitals worldwide.

Even in non-crisis times, staffing is the single largest expense of any medical organization delivering services to patients and consumers. In most hospitals, staffing represents more than half of all total expenses. Data and AI systems allow healthcare organizations to predict staffing levels with optimal accuracy and efficiency.

Benefits of implementing staffing management

For providers

- **Improved staff retention.** Improve the retention of hard-to-find specialty clinicians to maintain sustainable teams. Use predictive analytics to understand when an employee is at risk of resigning.

- **Staff training**. Measure the success of training programs to improve them. Good training is critical in healthcare because clinician performance has a direct impact on the wellbeing of patients.

- **Staffing level assessment.** Predict staffing levels and skill sets to optimize them based on the number of patients and the level of acuity of care to be provided.

Healthcare Employee Retention is a solution that uses client data to estimate employee flight risk. It includes a predictive model and reporting that identifies which employees might resign based on historical information from previous team members.
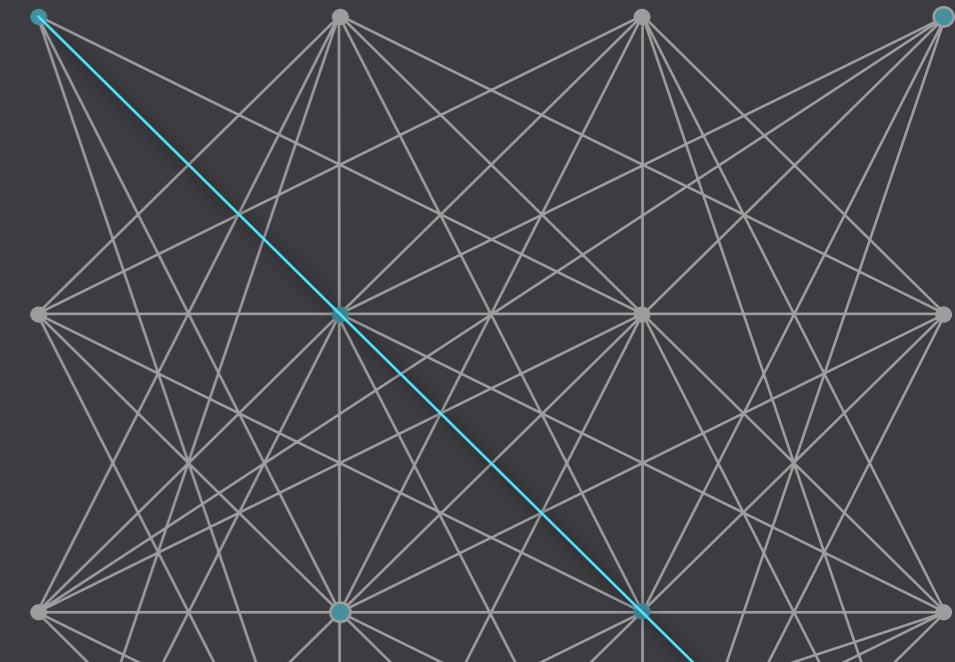
Greater Manchester Mental Health integrates Microsoft technology to reach more mental health patients

With a pandemic underway, the need for mental health services has skyrocketed. Microsoft has been working overtime to help mental health organizations scale up accordingly.

Greater Manchester Mental Health NHS Foundation Trust, a trust that delivers mental health services throughout Greater Manchester and Cumbria in the United Kingdom, supports 6,000 staff across 100 locations, including mobile workers and consultants. To meet the needs of this on-the-go workforce, the health system integrated some key Microsoft products, including videoconferencing, to help them stay connected. Armed with the right technology, employees can now move wherever they need to in a secure, seamless, and scalable way.

All this support means that employees can focus on what's most important: delivering mental health resources to as many patients as possible in a time of great need.

See how Greater Manchester Mental Health stays connected ❯

"We have only skimmed the surface of the power that we have within [Microsoft Teams]."

—Grace Birch,
Associate Director of IM&T,
Greater Manchester Mental Health NHS Foundation Trust

Claims management

Start with these questions

What percentage of filed claims are being denied or require rework before being paid? Are you seeing changes in this trend?

What are the top reasons for claims being denied?

Key benefits

For providers:

Claims management

Denials and revenue management

For payors:

Claims and fraud management

Denial management

What is claims management?

Claims management is the organization, billing, filing, updating, and processing of medical claims related to patient diagnoses, treatments, and medications.

How can it help your organization?

Claims fraud, waste, and abuse are significant issues worldwide. They encompass a wide spectrum of activities, including deceptive billing for services not rendered, performing unnecessary medical services, and abusing payment rules by coding services at higher levels than actually performed.

Denied claims represent extraordinary administrative costs to health providers and payors.

Claims analytics helps you efficiently predict patterns and detect anomalies to fight fraud and waste.

Benefits of implementing analytics for claims management

For providers

- **Claims management.** Improve the identification, management, and collection of patient service revenue.

- **Denials and revenue management.** Reduce the number of denied claims, a primary contributor to bad debt that represents millions in lost net patient revenue every year.

For payors

- **Claims and fraud management.** Assess the appropriateness of a claim and predict anomalies within the entire claims data universe to prevent fraudulent activities. For payors, claims management is a critical aspect in determining whether to pay or deny claims and in determining the rate of payment for services a health provider bills to the payor.

- **Denial management.** Use analytics to track the number of claims filed by providers that a payor denies. For payors, denied claims create large overhead costs.

Cerner creates a single source of truth, powered by Microsoft technology

Cerner's data was in disarray. The global healthcare solutions provider was saddled with disparate data sources, resulting in low data confidence and poor data hygiene. At the same time, upper management was pushing for greater adoption of cloud solutions company-wide for its low-cost, high-automation benefits.

By leveraging Microsoft cloud technology, a solution was born. Cerner created a new system called Beacon that provided a single source of truth for data. Beacon is powered by a robust set of Microsoft products, including the Microsoft Azure data platform, Azure Data Factory, Azure Data Lake Analytics, and Azure Databricks, as well as Microsoft Power BI and Azure SQL Database. Using a powerful set of integrated tools set Beacon up for maximum success.

Learn more about Cerner's data consolidation 〉

"We are going in the direction of retiring OBIEE reporting. Our choice is to replace it with Power BI. Having datasets in Azure made it easier to start pivoting in that direction."

—David Dvorak,
Lead Technology Architect, Cerner Corporation

Cost management

Start with these questions

How do your operating costs compare with reimbursements?

What are your top cost drivers?

Do you have systems in place that help you predict costs so you can better manage them?

Key benefits

For providers:

Staffing optimization

Supply cost management

Throughput management

For payors:

Fraud detection

Shorter patient stays

Claims denial management

What is cost management?

Cost management is a broad category relevant to all aspects of care delivery. It encompasses evaluation of all major provider and payor systems that determine the eventual cost of providing and paying for health and medical services.

How can it help your organization?

Most provider and payor organizations today exist on razor thin operating margins. In most countries, the cost of providing and paying for care is rising faster than reimbursements are increasing.

Health providers and payors are using solutions that improve the management of costs while maintaining the quality of services provided.

Cost management solutions use analytics to evaluate and improve the efficiency of major systems used in providing health and medical services.

Benefits of implementing analytics for cost management

For providers

- **Staffing optimization.** Match staffing requirements—typically the largest single cost—to the current and future mix of patients.

- **Supply cost management.** Evaluate which supplies are most cost effective.

- **Throughput management.** Optimize the flow of patients through facilities—typically the second-highest cost—including hospitals, emergency departments, operating theaters, and imaging departments.

For payors

- **Fraud detection.** Spot potentially fraudulent claims, including those miscoded to generate higher payments.

- **Shorter patient stays.** Predict lengths of stay for covered services to estimate and minimize costs.

- **Claims denial management.** Predict which claims will be denied, reducing the number of denials and the cost of managing them.

How Consumer Direct Care Network empowered an 8x increase in customer transactions with Microsoft Azure

Consumer Direct Care Network (CDCN) is a recognized leader in the personal care services industry, with more than 75,000 clients across the nation.

As the company began rapidly expanding, its legacy platform struggled to keep pace with the stringent performance demands brought on by such exponential growth. This not only limited the company's ability to grow and serve new customers, it also significantly contributed to higher costs and ultimately compromised the customer experience.

CDCN turned to Microsoft for help in the design and deployment of a cloud-based solution capable of handling over 400,000 transactions a week, a massive increase over the fewer than 45,000 weekly transactions made prior to their unprecedented growth. The solution also allowed CDCN to expand its online portal capacity to serve 200,000 users—five times the capacity of the legacy platform.

Learn more about CDCN's innovative solution >

"The entire project team, from top to bottom, was delivered as planned, and even exceeded our expectations."

—Jeff Harriott,
Chief Technology Officer, CDCN

43

05

Holistic analytics in healthcare

Readmissions management

Start with these questions

What level of inpatient readmission rates is your organization currently experiencing?

Has your current performance with respect to readmissions affected your level of reimbursement?

Do you have a way to proactively assess which patients have the highest risk of readmission?

What is readmissions management?

A *hospital readmission* occurs when a patient who has been discharged from a hospital is admitted again within a specific time interval. Avoidable readmissions are a strong indicator of a fragmented healthcare system that too often leaves discharged patients confused, consumes resources that are already stretched thin, and produces higher treatment costs.

How can it help your organization?

Analytics solutions can be used to evaluate and predict which patients are at risk for readmission, so hospitals can create a plan to reduce that risk.

Key benefits

For providers:

Readmittance risk analysis

For payors:

Reduced hospital readmissions rate

Reduced emergency department bounce-back rate

# Benefits of implementing readmissions management

For providers

- **Readmittance risk analysis.** Provides patients with a risk rating before a hospital stay, as they go through treatment and recovery, and as part of the discharge process. This rating will assess their likelihood of being readmitted following discharge.

For payors

- **Reduced hospital readmissions rate.** Use analytics to help with reporting readmission rates and penalizing providers whose rates are high.

- **Reduced emergency department bounce-back rate.** Reduce bounce-back—an inpatient readmission that occurs when a patient seen in an emergency department returns after discharge because the condition doesn't improve after the treatment.

Throughput management
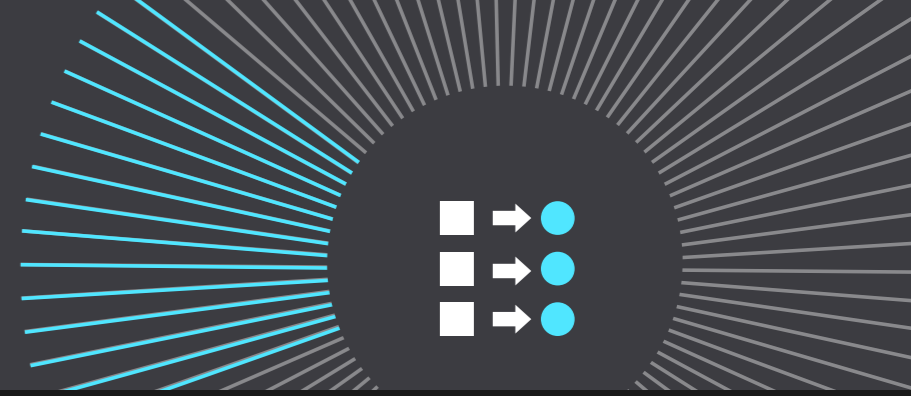
Start with these questions

What is the average occupancy of your inpatient facilities?

How often are your facilities at capacity?

Do you ever have issues like long wait times in your emergency department caused by variance in demand for services?

Key benefits

For providers:

Hospital bed optimization

Improved patient satisfaction scores

Shorter wait times

Improved patient transfer process

What is throughput management?

The process known as *throughput management* includes systems and processes used to manage the cycling of patients through a health organization's physical facility.

Scenarios include moving an inpatient through the hospital or moving an urgent care or trauma case through the emergency department to either discharge or admission.

How can it help your organization?

With increasing patient demand and constrained physical resources, optimizing throughput is an essential operations management strategy. The use of data and analytics to optimize inpatient throughput enhances patient access, reduces unit cost, and improves service levels, leading to measurable value in metrics like reduced wait times, better use of capital, and an increased return on assets.

Improving throughput allows more patients to receive care at each facility, reducing the need to add expensive new facilities or beds.

Benefits of implementing throughput management

For providers

- **Hospital bed optimization.** Determine and predict the flow and progression of inpatients through a system, thereby maximizing the use of patient rooms and facilities.

- **Improved patient satisfaction scores.** Correlate outcomes and experience data to patient journey paths. Identify reengineering opportunities by observing correlations and other data.

- **Shorter wait times.** Predict and manage variables like staffing to improve efficiencies in care delivery in emergency departments.

- **Improved patient transfer process.** Help staff spot and resolve bottlenecks in inpatient transfers within a facility (for example, a patient waiting to be admitted to intensive care, where a bed is available but not yet cleaned).

Northwell Health uses a Microsoft chatbot to speed up data access exponentially

Northwell Health was on a mission to make medical information much more accessible for healthcare providers. The result was NORA, a chatbot extension for Microsoft Teams. NORA enables clinicians to use Teams chats to get patient information quickly, refill prescriptions, and consult other specialists on the fly.

Learn how Northwell Health's chatbot surfaces data ❯

"Microsoft Teams and the NORA app built inside it are the only technologies I've ever used that have actually decreased my work. The speed at which we can access information and get lab results is truly revolutionary."

—Dr. Mark Atlas,
Director, Fellowship Training Program
Division of Pediatric Hematology/Oncology
and Stem Cell Transplantation, Northwell Health

06

Bringing it all together

Choosing the right provider is the key to a seamless digital transformation

Microsoft Cloud for Healthcare provides trusted, integrated capabilities that make it easier to create personalized patient experiences. These capabilities also give clinicians connected tools and help them adopt important healthcare data standards. Our partnership with Nuance offers you a way to address the biggest challenges in healthcare with the broadest and deepest set of trusted AI solutions.

Most importantly, Microsoft Cloud for Healthcare helps healthcare organizations accelerate their digital transformation by augmenting the Microsoft Cloud with industry-relevant compliance, security, and interoperability standards. It helps unify the data estate through a common data model to break down data silos, helping healthcare organization improve insights, regardless of where the data resides.

The case for the cloud **is clear**

Organizations that have moved to the cloud are already experiencing the benefits of transformation across the board. As Microsoft Cloud for Healthcare utilizes the strength of the Microsoft Cloud, its capabilities can be fully customized to each customer's unique environment and business processes.

The benefits of Microsoft Cloud for Healthcare include:

- **Agility.** Organizations can get full visibility into their data supported by AI analyses to enable new, unforeseen use cases and insights.

- **Extensibility.** Microsoft solutions make it easier to adapt and grow to your company's needs.

- **Interoperability.** Organizations can unify their data by removing data silos across patient, clinical, operation, and enterprise data systems.

- **Robust partner ecosystem.** Our growing ecosystem of partners is dedicated to serving customers by helping provide more integrated healthcare solutions and identifying new opportunities for innovation that extend the core cloud and Nuance capabilities across the continuum of care.

07
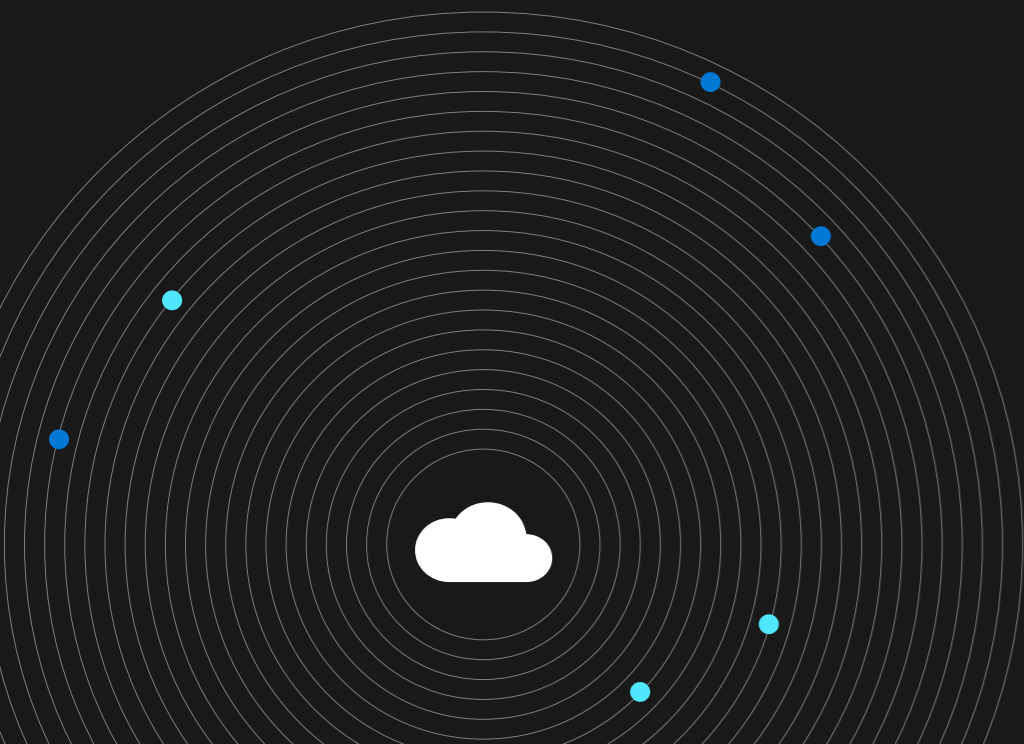
Keeping up with the digital evolution

Better experiences, better insights, better care

The introduction of AI capabilities has changed the game for healthcare providers. Microsoft is committed to leveraging technology to drive inclusive growth. Microsoft's vision is to build a sustainable future for every company, everywhere.

Why it's time to make the move to the cloud

- **Patient expectations.** Patients today expect the best of all worlds. They expect the modern conveniences they experience in other industries, like real-time alerts, personalized experiences, and intuitive online tools. They also expect privacy, especially when it comes to confidential health information. The cloud makes it easier to deliver on these expectations.

- **Data breach protections.** Cybercriminals are getting more sophisticated and will target businesses of all sizes. The cloud helps prevent costly breaches and makes sure your data is safe. This ensures that crucial patient trust remains intact, and your corporate reputation is protected.

- **The need to unlock data.** The rise in digital healthcare use in the past year has created an unprecedented amount of data, most of which is trapped in silos. The cloud enables organizations to consolidate data sets. By consolidating data and then layering on AI, it's infinitely easier to draw actionable insights from this mountain of data.

Microsoft is
your trusted partner

The right cloud provider ensures that patient data is kept safe so that healthcare organizations can reap the benefits of the cloud with minimized risk. Microsoft is a trusted partner that safeguards data and keeps breaches at bay.

This is vitally important for any AI solution, but doubly so in the healthcare industry, where the protection of patient data is highly regulated, and leaks or data breaches carry stiff penalties.

One of the reasons why Microsoft has grown to become the healthcare industry's vendor of choice is that organizations know they can trust Microsoft to protect sensitive data. As a world leader in cybersecurity, AI, and the ethical use of technology, Microsoft not only protects data from leaks and breaches, but also from being used in questionable or ethically ambiguous ways.

Empowering every person and organization on the planet to achieve more

As a single company, we are uniquely positioned to amplify an organization's ability to help others by leveraging outcomes-based AI to address the biggest challenges transforming the future of work and care. With powerful, robust AI backed by decades of domain expertise—coupled with the scale, security, and power of the Microsoft Cloud— we have the opportunity to put advanced AI solutions into the hands of professionals everywhere, driving better decision making, creating more meaningful connections, and producing tangible outcomes.

→ **Explore Microsoft Cloud for Healthcare**

Sources

[1] Ashley Kirzinger, Audrey Kearney, Liz Hamel, and Mollyann Brodie, "KFF/ The Washington Post Frontline Health Care Workers Survey," Kaiser Family Foundation, April 6, 2021.

[2] Grand View Research, *Artificial Intelligence Market Size, Share & Trends Analysis Report By Solution, By Technology (Deep Learning, Machine Learning, Natural Language Processing, Machine Vision), By End Use, By Region, And Segment Forecasts, 2022-2030*, accessed June 2022.

[3] Decision Inc., "The Future of Business Resilience," accessed December 28, 2020.

[4] Microsoft, "Microsoft Accelerates Industry Cloud Strategy for Healthcare with the Acquisition of Nuance," April 12, 2021.

[5] Halsted R. Holman, "The Relation of the Chronic Disease Epidemic to the Health Care Crisis," ACR Open Rheumatology, February 19, 2020.

[6] Optum, *3rd Annual Optum Survey on AI in Health Care*, 2020.