Leveraging Technology and Value-Based Care

Case Study: Geisinger Health System

Research collaboration led by

manatt

This case study is focused on how Geisinger Health System, a large regional health care organization, achieves success in its value-based care (VBC) arrangements by leveraging technology solutions. This case study highlights:

- How Geisinger leverages augmented intelligence (AI) to improve care for key populations, increasing patient access, achieving improved clinical outcomes, and reducing health care costs; and
- How Geisinger's System to Track Abnormalities of Importance Reliably (STAIR) program—a program for managing patients with incidental lung-nodule findings—uses natural language processing (NLP) to screen radiology reports and optimize follow-up care and treatment for patients.

About the AMA

The American Medical Association is the powerful ally of and unifying voice for America's physicians, the patients they serve, and the promise of a healthier nation. The AMA attacks the dysfunction in health care by removing obstacles and burdens that interfere with patient care. It reimagines medical education, training, and lifelong learning for the digital age to help physicians grow at every stage of their careers, and it improves the health of the nation by confronting the increasing chronic disease burden. For more information, visit ama-assn.org.

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Introduction

Over the last decade, United States health care payers, physician practices, and hospitals have increasingly adopted VBC arrangements. As described in *A Playbook of Voluntary Best Practices for VBC Payment Arrangements*, developed by the American Medical Association (AMA), America's Health Insurance Plans (AHIP), and the National Association of Accountable Care Organizations (NAACOS), these models seek to align payment with performance on quality, cost, and the patient experience, which can, in turn, motivate changes in care delivery to further the goals of evidence-based, preventive, equitable, and coordinated whole-person care. Organizations participating in VBC arrangements can enhance their performance by strategically adopting technology solutions aligned with their program goals.

The AMA is publishing case studies that highlight health care organizations that successfully leverage technology to advance VBC. This case study is focused on Geisinger Health System, a large regional health care organization, and how it leverages AI to optimize care for key populations. By doing so, it improves patient access and outcomes while reducing the total cost of care.

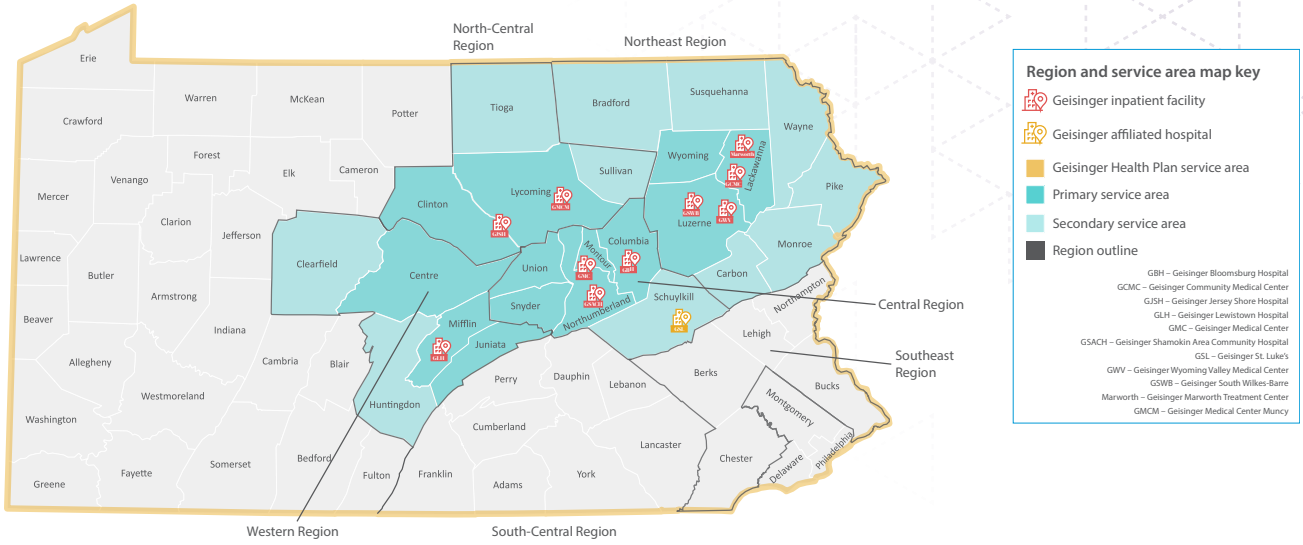
Background

Geisinger Health System, based in Danville, Pennsylvania, serves over one million people across 67 counties in northeastern and central Pennsylvania. The system includes ten hospital campuses and 133 primary and specialty clinics and employs more than 1,700 physicians and 25,000 staff. Additionally, the Geisinger Health Plan (GHP) covers 600,000 people through commercial and government plans, with a network of 51,000 clinicians and 200 hospitals across the state. GHP offers Medicare Advantage, Medicaid, commercial, and marketplace plans.

Contextual Landscape

Geisinger's coverage area is predominately rural, with urban centers including Scranton, Wilkes-Barre, and State College, as demonstrated in Figure 1 on page 3. For some patients, this creates significant challenges with accessing care. Pennsylvania has the third-largest rural population in the nation, yet nearly half of the state's doctors practice in its three most populous counties, which contain 25 percent of the state's population. Fifty-five of Pennsylvania's 67 counties are designated as Medically Underserved Areas by the U.S. Department of Health and Human Services' Health Resources and Services Administration. This underscores Geisinger's critical role in addressing barriers to accessing preventive care, screenings, and treatment for its patient population.

Figure 1: Geisinger Service Area Map



Delivering VBC is one of Geisinger's core operational and strategic tenets. To best address the diverse needs of its patient population, Geisinger incorporates environmental and regional factors into its VBC strategy, tailoring care models to reflect the unique demographics, socioeconomic challenges, and chronic disease burdens within the communities it serves. Geisinger focuses on expanding access to high-quality, preventive care and deploying targeted interventions that align with the specific health needs and risks of its patients. This localized strategy ensures timely management of chronic conditions and promotes equitable health outcomes across the region, advancing Geisinger's mission to make better health easier.

Experience with VBC

Under VBC arrangements, health care organizations are compensated based on care outcomes and performance metrics, such as cost and quality, which align with program goals. Geisinger, a nationally recognized leader in VBC, was an early adopter of these principles and has continued to expand its VBC initiatives over time.

In 2005, Geisinger was among ten organizations selected for the Centers for Medicare and Medicaid Services' (CMS) first Physician Group Practice (PGP) Demonstration project, Medicare's inaugural pay-for-performance initiative, and one of its earliest VBC efforts. Notably, Geisinger was the only organization to achieve 100 percent of the quality performance targets in four out of the demonstration's five years.

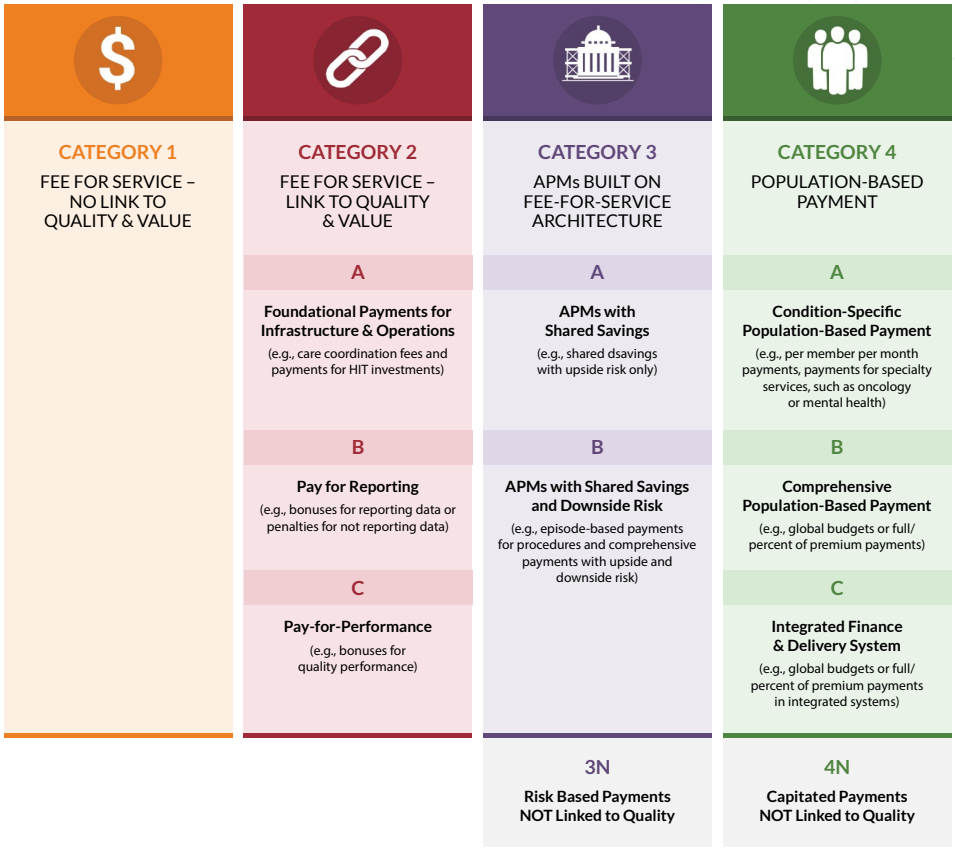
VBC arrangements, as outlined in the *AMA's Best Practices Playbook*, can vary greatly. Figure 2, the Health Care Payment Learning & Action Network's (HCP-LAN) Alternative Payment Model Framework, illustrates the range of VBC arrangements.

In 2023, nearly 80 percent of the 800,000 patients served by Geisinger participated in VBC arrangements. These programs span all categories of the HCP-LAN framework, including:

- Pay-for-performance arrangements
- Medicare Accountable Care Organization (ACO) model programs through the Keystone ACO (detailed on page 4)
- CMS episode-based payment programs, such as Medicare's Bundled Payment for Care Improvement (BPCI) initiatives (detailed on page 5)
- Population-based payment arrangements

In 2023, Geisinger's internal estimates indicated that the organization earned over $45 million in total annual financial incentives through its VBC arrangements. The following section provides details on select Geisinger VBC initiatives.

Figure 2. The Updated Alternative Payment Model Framework



Source: Health Care Payment Learning & Action Network (2017) Action Network

Keystone ACO

Geisinger has been a member of the Keystone ACO since its founding in 2013. The Medicare Shared Savings Program (MSSP) is a voluntary program that rewards health care providers for improving patient care and reducing costs. Organizations must be part of an ACO to participate in the alternative payment model.

As a member of the Keystone ACO, Geisinger has continued to take on greater financial risk, transitioning from the Track 1 MSSP model to the more advanced Basic Track E MSSP model. In 2025, it will advance further to the MSSP ENHANCED track, which allows ACOs to share 75 percent of savings or losses.

Each year, the Keystone ACO delivers over $800 million in health care services to more than 80,000 Medicare beneficiaries across Pennsylvania. Since 2013, the Keystone ACO's participating organizations have saved Medicare an estimated $50 million in expenditures (excluding shared savings payments) while improving preventive care delivery and chronic disease management outcomes.

BPCI Program

Geisinger has participated in Medicare's BPCI program since 2014, which incentivizes quality improvement and cost reduction for care episodes beginning with hospitalization. By focusing on care coordination and evidence-based protocols, Geisinger aims to shorten hospital stays and decrease readmissions. If the total care cost for a 90-day episode is below the target, Medicare shares the savings with Geisinger. Through the BPCI and BPCI Advanced models, Geisinger has achieved over $25 million in gross savings for Medicare.

An Expanded Focus on VBC through Risant Health

In 2023, Kaiser Foundation Hospitals and Geisinger Health announced the launch of Risant Health, a nonprofit focused on expanding access to VBC. Geisinger became the first health system to join, aiming to increase access to VBC nationwide. Health systems within Risant Health will continue to serve their local communities while leveraging Risant's value-based platform.

Strategies for Leveraging Technology Solutions to Deliver VBC

Investing in technology and data sharing is essential for health care organizations to succeed in VBC. This section provides examples of how Geisinger strategically leverages AI to advance its VBC objectives by using it to identify high-risk individuals, allocate system resources, and drive timely interventions. This proactive approach not only improves patient outcomes, but also reduces costly care, achieving a balance of higher quality and improved efficiency.

Leveraging AI to Support Population Health

Many patients who are at heightened risk for health complications—due to factors like pre-existing conditions, lifestyle, genetics, or environmental influences—often go unnoticed or miss timely follow-up care, resulting in costly, preventable adverse outcomes. AI predictive algorithms can analyze vast amounts of data, identify patterns and at-risk patients, and make recommendations for intervention.

Geisinger leverages predictive AI to support population health, using a risk stratification model to predict which chronic disease patients are at highest risk of hospital admission over the next 30 days. The model identifies patients and drives targeted care management interventions by case managers. This has been a successful tool, leading to a ten percent reduction in avoidable emergency department visits and hospital admission among patients with chronic conditions. This directly impacts Geisinger's performance in VBC arrangements by addressing total medical spend and quality metrics, such as hospital admission rates for patients with multiple chronic conditions.

Leveraging AI to Optimize Physician Time

Referrals and follow-up care are typically managed manually, relying heavily on physician discretion. This approach introduces variability and inefficiencies, leading to unnecessary referrals for some patients while others miss essential follow-up care. These inconsistencies may waste resources and can delay critical interventions.

While physician guidance is critical, AI can support appropriate patient triage by identifying patients who would benefit from timely specialist appointments. This approach ensures that limited specialist resources are directed toward appropriate cases.

Geisinger leverages NLP to scan patient data and documents to identify high-risk patients and ensure timely follow-up for incidental lung nodule findings, as described fully in the next section. Its model can analyze entire documents to pinpoint patients that would benefit from early intervention or are overdue for critical care. This ensures that specialists are spending their time with the patients who need it most and those patients who do not require office visits can be appropriately managed by case managers or nurse practitioners instead.

Leveraging AI to Support Early Intervention

AI can support early intervention by identifying patients at high risk for specific conditions. As an example, Geisinger uses a machine learning model to identify patients at highest risk for colorectal cancer and other gastrointestinal disorders, targeting them for outreach and early colonoscopy screenings. Research into the program highlights how of the flagged high-risk patients who received a colonoscopy, 70 percent of them resulted in significant findings. Diagnosing and treating colorectal cancer at an early stage typically improves prognosis and reduces costs of treatment.

The following section is a deep dive into one of Geisinger's key programs leveraging AI, the STAIR program.

Technology Enabled VBC in Action: Geisinger's STAIR Program

The STAIR program combines AI technology with key people and process improvements. Together, these components support Geisinger's VBC arrangement performance goals of improving patient outcomes and managing the total cost of care.

Background

Each year, nearly 4.8 million people in the U.S. undergo chest computed tomography scans, with 1.5 million revealing incidental lung nodules that require follow-up. Although only a small percentage of these nodules are cancerous, current practice involves referring all patients to specialists, which is inefficient due to the limited number of pulmonologists (approximately 5,500 nationwide).

Additionally, up to 50 percent of incidental lung nodules fail to receive appropriate follow-up, leading to delayed cancer diagnoses and increased cost to treat. To address this, Geisinger launched the STAIR program in 2019, improving patient care and supporting key VBC goals like cost management and access to care.

STAIR Program Goals

The STAIR program aims to ensure "the right care, at the right time, in the right setting, for all patients every time" according to Dr. Yatin Mehta, a Geisinger pulmonologist and STAIR program director. Early detection and prompt treatment are critical for improving survival rates of lung cancer and to avoid costly noncurative care for advanced cancers.

The program is structured around four key elements:

1. **Identification**
   Patients enter the STAIR program through several channels, including traditional referrals for lung nodule management, automatic enrollment of high-risk nodules from the lung cancer screening program, and advanced NLP technology that scans radiology data in the electronic health record (EHR) to identify and enroll high-risk patients.
2. **Evaluation**
   Once identified and enrolled, a team of specialized pulmonology advanced practitioners formulate lung nodule care plans with physician oversight. Personalized plans are shared with patients and their referring providers. Clinic visits are scheduled only when necessary, often for other pulmonary diseases found in imaging.
3. **Tracking**
   Health care coordinators monitor patient progress to ensure adherence to the care plan, preventing missed follow-ups. This process continues until a final decision is made, whether that be a cancer diagnosis or a determination that no further treatment is needed.
4. **Outcome**
   The program has achieved zero missed malignancies among enrolled patients. By ensuring comprehensive follow-up, STAIR sets a new standard for managing incidental findings and improving patient outcomes.

Challenges and Strategies to Overcome

STAIR program leadership initially faced challenges with getting primary care physicians to follow the alternative consultative model. To build trust and improve adoption of the new program, Geisinger established a steering committee with physician leaders from primary care, pulmonology, radiology and external referring physicians.

Through clinician education initiatives, personalized outreach and EHR workflow enhancements, physicians began to see the STAIR program as a helpful process that could reduce administrative burden and be customized to meet patients where they are.

Making an effort to listen, incorporate feedback, and educate physicians on changes to the program fosters better collaboration, increases adherence to new protocols, and minimizes workarounds, establishing the STAIR program as the standard for managing incidental lung nodule across the system.

Impact and Outcomes

AMA's "Return on Health: Moving Beyond Dollars and Cents in Realizing the Value of Virtual Care" report offers a framework to illustrate the various ways in which technology enabled programs may increase the overall "return on health" by generating a positive impact for patients, clinicians, payers and society going forward. The below figure includes the six value streams that define the ways in which these models generate value and provides examples of how the STAIR program achieves value for Geisinger and its patients.

AMA Return on Health Framework Value Stream Impact Summary – STAIR Program

Figure 3. Geisinger's STAIR Program and Impact Summary

Value Stream	Evidence of Program Impact
Clinical outcomes, quality, and safety	• Since the STAIR program launched in March 2020, there have been zero missed malignancies among patients who were enrolled in the program.
Access to care	• Patient wait times to see pulmonologists dropped from 112 days to 12, freeing up over 9,000 pulmonology visit slots for more complex cases.
Patient, family, and caregiver experience	• Over 90 percent of patients completed the program, with nine percent diagnosed with lung cancer, most at a curable stage.
Clinician experience	• Providers reported higher satisfaction due to optimized scheduling, better resource allocation, and reduced concerns about missing follow-up care for lung nodules.
Financial and operational impact	• 94 percent of the 9,000+ patients enrolled and screened did not need a clinic visit.
Health equity	• Standardized workflows ensure equitable access to the STAIR program, regardless of referral source.

Opportunities for Continued Digitally Enabled Innovation Moving Forward

The STAIR program's success in managing incidental lung nodules underscores the transformative potential of AI-driven care models in advancing VBC strategies. Geisinger has expanded the program to include abdominal aortic aneurysms, now managing care for over 8,000 patients. By leveraging AI to proactively identify high-risk patients, streamline workflows, and optimize resource allocation, Geisinger demonstrates how technology can improve outcomes and reduce costs.

Looking ahead, there is ample opportunity for AI to meaningfully impact VBC. It can enable health systems to achieve population health goals, manage chronic diseases, improve cost-efficiency and resource utilization, and promote equitable access to care—essential elements for success in VBC arrangements. Programs like STAIR illustrate how AI bridges clinical precision with financial sustainability, reinforcing the importance of technology in reshaping care delivery.

Glossary

Accountable Care

A person-centered care team takes responsibility for improving quality of care, care coordination, and health outcomes for a defined group of individuals, to reduce care fragmentation and avoid unnecessary costs for individuals and the health system.
(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)

Artificial Intelligence

The ability of computers to perform tasks that are typically associated with a rational human being—a quality that enables an entity to function appropriately and with foresight in its environment.
(Source: AMA Future of Health Report)

Augmented Intelligence

Computational methods and systems that enhance human capabilities and decision-making.
(Source: AMA Future of Health Report)

Attribution

The process by which patients and their associated medical costs are assigned to a physician or entity.
(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)

Benchmark

The financial target in a VBC payment arrangement with which performance year expenditures are compared.
(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)

Bundled Payment

A payment structure in which different health care providers who are treating a patient for the same or related conditions are paid an overall sum for taking care of the condition rather than being paid for each individual treatment, test, or procedure. In doing so, providers are rewarded for coordinating care, preventing complications and errors, and reducing unnecessary or duplicative tests and treatments.
(Source: HealthCare.gov)

Capitation

A fixed sum of money, per patient per period of time, or global budget for providing services.
(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)

Downside Risk

A risk arrangement that includes downside risk, or the potential for losses. A risk arrangement that includes both upside and downside risk may be referred to as a "two-sided risk arrangement." *(Source: CMS)*

Fee-for-Service (FFS)

A method in which doctors and other health care providers are paid for each service performed.
(Source: HealthCare.gov)

Generative Artificial Intelligence

Artificial intelligence systems that can generate novel text, images, videos, or other outputs, typically based on foundational models. *(Source: AMA Future of Health Report)*

Group Practice Reporting Option

A mechanism that allows group medical practices to report quality and performance data to Medicare under programs like the Merit-Based Incentive Payment System, with the goal of evaluating and rewarding high-quality care. *(Source: CMS)*

Health Information Exchange (HIE)

An HIE allows health care providers to improve patient care by efficiently and securely sharing a patient's digital medical information. *(Source: AMA)*

Machine learning (ML)

A subtype of AI in which complex algorithms are trained to make predictions about future outcomes. ML can be supervised or unsupervised. *(Source: AMA Future of Health Report)*

Medicare Shared Savings Program (MSSP)

A voluntary program that promotes accountability for a population of Medicare beneficiaries, improves the coordination of FFS items and services, and encourages investment in infrastructure and redesigned care processes for high-quality and efficient service delivery. *(Source: CMS)*

Medically Underserved Area (MUA)

MUAs have a shortage of primary care health services within geographic areas such as a whole county, a group of neighboring counties, a group of urban census tracts or a group of county or civil divisions. *(Source: HRSA)*

Natural Language Processing (NLP)

An algorithm's ability to interpret and/or translate language. *(Source: AMA Future of Health Report)*

Pay-for-Performance

Under a pay-for-performance approach, the payer compensates physicians according to an evaluation of physician performance on defined metrics, typically as a potential bonus on top of the physician's FFS compensation The bonus is not paid per transaction but, rather, at a defined time period (e.g., quarterly or annually). *(Source: Evaluating Pay-For-Performance Contracts, AMA)*

Risk Adjustment

A statistical method that converts the health status of a person into a relative number. *(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)*

Shared Risk

A payer arrangement whereby there is potential upside or downside reimbursement, in addition to FFS reimbursement, depending on whether aggregate population health care costs are more or less than a predefined baseline amount. The "savings" or "losses" are shared between the payor and the physician (or among physicians). *(Source: AMA Payor Contracting Toolkit)*

Shared Savings

Shared savings is a payment strategy that offers incentives for providers to reduce health care spending for a defined patient population by offering them a percentage of net savings realized as a result of their efforts. *(Source: The Commonwealth Fund)*

Total Cost of Care Arrangement

Refers to a contract, often between three and five years in length, between a health plan and a VBC entity where the VBC entity takes responsibility for the total cost and quality of care for an attributed patient population that is calculated for a defined performance period, usually one year, and in exchange can receive or retain a portion of achieved savings or pay back any losses based on predetermined spending and quality targets or benchmarks.
(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)

Upside Risk

A risk arrangement whereby participants can share in potential financial gains. A risk arrangement that only includes upside risk may be referred to as a "one-sided risk arrangement." *(Source: CMS)*

VBC Payment Arrangement

Refers to the contracted terms between a health plan and VBC entity and/or participating practice(s) that links payment to performance on cost, quality, patient experience, or other defined metrics to encourage delivery changes that are expected to result in better patient outcomes, greater patient experiences, and/or cost efficiency. Payment to participating VBC entities and/or participating practice(s) is increased when quality of care increases and/or costs decrease, while payment is reduced when quality of care decreases and/or costs increase.
(Source: AHIP/AMA/NAACOS Playbook of Voluntary Best Practices for VBC Payment Arrangements)