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Geisinger Health System: Achieving the Potential of System Integration Through Innovation, Leadership, Measurement, and Incentives

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ABSTRACT: Geisinger Health System is a physician-led, not-for-profit, integrated delivery system serving an area with approximately 2.6 million people in northeastern and central Pennsylvania with innovative products and services designed to drive higher performance. Geisinger's leaders believe that the organization can simultaneously improve quality, satisfaction, and efficiency only by redesigning and reengineering the delivery of care. This philosophy is epitomized by ProvenCare, a portfolio of products (many of which are package-priced) for which care processes have been redesigned to reliably administer a coordinated bundle of evidence-based best practices. Use of the ProvenCare model has improved clinical outcomes while decreasing resource utilization. Fundamental to Geisinger's success are its vision of becoming a national model for care delivery, the leadership to achieve that vision reinforced with a performance-based compensation system strategically aligned with specific goals every year, and timely feedback using an advanced electronic health record to measure progress toward those goals.

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OVERVIEW

In August 2008, the Commonwealth Fund Commission on a High Performance Health System released a report, *Organizing the U.S. Health Care Delivery System for High Performance*, that examined problems engendered by fragmentation in the health care system and offered policy recommendations to stimulate greater organization for high performance.[1] In formulating its recommendations, the Commission identified six attributes of an ideal health care delivery system (Exhibit 1).

Geisinger Health System is one of 15 case study sites that the Commission examined to illustrate these six attributes in diverse organizational settings. Exhibit 2 summarizes findings for Geisinger. Information was gathered from the organization's leaders and from a review of supporting documents.[2] The

Exhibit 1. Six Attributes of an Ideal Health Care Delivery System

- ***Information Continuity*** Patients' clinically relevant information is available to all providers at the point of care and to patients through electronic health record systems.
- ***Care Coordination and Transitions*** Patient care is coordinated among multiple providers, and transitions across care settings are actively managed.
- ***System Accountability*** There is clear accountability for the total care of patients. (We have grouped this attribute with care coordination since one supports the other.)
- ***Peer Review and Teamwork for High-Value Care*** Providers (including nurses and other members of care teams) both within and across settings have accountability to each other, review each other's work, and collaborate to reliably deliver high-quality, high-value care.
- ***Continuous Innovation*** The system is continuously innovating and learning in order to improve the quality, value, and patients' experiences of health care delivery.
- ***Easy Access to Appropriate Care*** Patients have easy access to appropriate care and information at all hours, there are multiple points of entry to the system, and providers are culturally competent and responsive to patients' needs.

case study sites exhibited the six attributes in different ways and to varying degrees. All offered ideas and lessons that may be helpful to other organizations seeking to improve their capabilities for achieving higher levels of performance.[3]

ORGANIZATIONAL BACKGROUND

Geisinger Health System is a physician-led, not-for-profit, integrated delivery system headquartered in Danville, Pennsylvania. It serves an area with approximately 2.6 million people living in 43 counties of northeastern and central Pennsylvania (Exhibit 3). In general, this population is older, poorer, sicker, more rural, and less transient than the national median. Geisinger's market share is about 30 percent overall (including both primary and secondary markets) and its annual revenue is more than $2 billion.

The system employs more than 12,000 people, including a multispecialty group of more than 740 physicians practicing at 50 clinical sites. About 200 of these physicians provide primary care in 40 community practice clinics; other physicians provide specialty care, predominantly from three large hubs. Major facilities include three acute/tertiary/quaternary hospitals (Geisinger physicians work exclusively in one hospital, while both Geisinger and non-Geisinger community physicians treat patients in two hospitals), three ambulatory surgery centers, specialty hospitals, and an inpatient and outpatient drug and alcohol treatment center. Annual patient volume exceeds 40,000 inpatient discharges and 1.5 million ambulatory visits.

Geisinger Health Plan, created in 1985, is a network model health maintenance organization offering group, individual, and Medicare coverage. Approximately 30 percent of Geisinger's patients are insured by Geisinger Health Plan. About half of the health plan's 220,000 members have a Geisinger primary care physician based in one of the 40 community clinics. The health plan also contracts with more than 18,000 independent providers including 90 community hospitals.

Founded in 1915 by Abigail Geisinger, whose aim was to "make it the best," Geisinger's vision is "Heal, Teach, Discover, and Serve." It is a teaching campus for the Temple University School of Medicine and the Philadelphia College of Osteopathic Medicine, and conducts research in its own facilities and through affiliation with other academic institutions. Its Geisinger Center for Health Research conducts health-service, epidemiologic, and population-genetics research with the goal of translating innovative new models of patient care to clinical practice.

INFORMATION CONTINUITY

Since 1995, Geisinger has invested more than $100 million in hardware, software, and training to implement its electronic health record (EHR) system, built on a third-party platform (EpicCare from Epic Systems Corp.). Installation of the system was completed in 2002 at all Geisinger ambulatory sites and in 2007 at Geisinger Medical Center (the main inpatient campus). Installation is in the final stages at Geisinger Wyoming Valley and Geisinger South Wilkes-Barre hospitals. Digital radiology images are distributed through a picture archiving and communication system (PACS).

The EHR now contains more than 3 million patient records and acts as a "central nervous system" for the organization, supporting the provision of evidence-based practices at the point of care and enabling performance monitoring at the system, departmental, and physician level. Following implementation of the EHR at Geisinger Medical Center, the number of

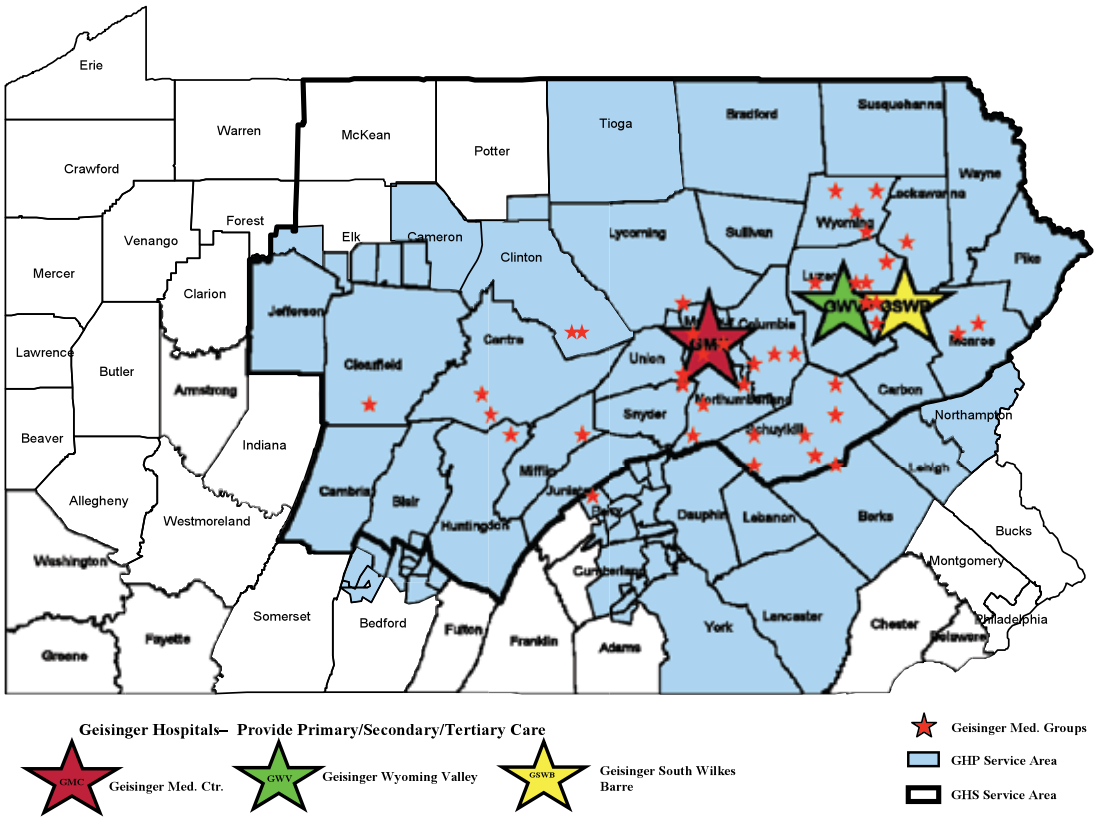
Exhibit 2. Case Study Highlights

Overview: A nonprofit, physician-led, integrated health system serving an area with 2.6 million people in 43 counties of rural northeastern and central Pennsylvania through three acute/tertiary/quaternary hospitals and an alcohol/chemical dependency treatment center; a multispecialty group practice employing more than 740 physicians; 50 practice sites including 40 community practice clinics; the 220,000-member Geisinger Health Plan, which offers group, individual, and Medicare coverage and contracts with more than 18,000 independent providers including 90 hospitals; the Geisinger Center for Health Research; and medical education programs serving medical students, residents, fellows, and other medical professionals. Annual patient volume exceeds 40,000 inpatient discharges and 1.5 million outpatient visits.

Attribute	Examples from Geisinger Health System
Information Continuity	Electronic health record (EHR) with decision support across all group-practice sites (and available to more than 2,000 users in non-Geisinger clinical practices) acts as an organizational "central nervous system" supporting the provision of evidence-based care and enabling system performance monitoring. Collaborated with other regional caregivers and institutions to develop a regional health information exchange that electronically links providers in the service area. Patient web portal used by more than 100,000 patients for health information, appointment scheduling, prescription ordering, and e-mail with clinicians. This innovation is associated with decreased patient "no-show" (missed appointment) rates and telephone calls and increased physician productivity.
Care Coordination and Transitions; System Accountability*	Piloting advanced medical home including round-the-clock primary care coverage, nurse case managers employed by health plan embedded in primary care practices, virtual-care management support, personal care navigator, home-based monitoring, and automated voice-response surveillance. Goals are to increase primary care contacts and timely follow-up after hospital discharge with improved outcomes (e.g., reduced rates of hospital admissions and readmissions) and savings in medical costs.
Peer Review and Teamwork for High-Value Care	Bringing physicians together in cross-disciplinary service lines to plan, budget, and evaluate one another's performance has transformed the culture for higher performance. ProvenCare packaged pricing products motivate physicians to efficiently and reliably deliver a bundle of evidence-based practices, such as close to 100 percent adherence to 40 heart bypass surgery processes and associated improvement in outcomes.
Continuous Innovation	Innovation architecture uses collaborative teams to redesign care process models and improve value in the prevention and treatment of disease (e.g., increased compliance to a bundle of nine evidence-based measures for diabetes care and other chronic disease control measures). Geisinger's vision is to become a national model for care delivery and an engine of innovation through: 1) leadership to achieve the vision; 2) a compensation system that is aligned toward the achievement of specific strategic goals; and 3) timely feedback of information on progress toward those goals.
Easy Access to Appropriate Care	Advanced-access redesign increased availability of same-day appointments from 50 percent in 2002 to 95 percent in 2006; 84 percent of sites have lead time of one day or less. Patient satisfaction increased 48 percent. Walk-in clinics in area retail stores, linked via EHR and the patient portal.

* System accountability is grouped with care coordination and transitions, since these attributes are closely related.

Exhibit 3. Geisinger Health System Service Area



Source: Geisinger Health System.

paper charts pulled there dropped by 1 million annually. (Clinical examples and results of EHR use are described in the sections that follow.)

More than 100,000 Geisinger patients are registered to use an online portal called "MyGeisinger" to access their health information and care plans, view laboratory test results and health care reminders, make appointments, pay their medical bills, request prescription renewals, and communicate with their physician about nonurgent medical problems. Almost 30 percent of MyGeisinger users are age 55 and older. Geisinger physicians receive an incentive for their patients who agree to sign up for electronic access on MyGeisinger, with approximately 2,000 new users enrolling each month. This innovation was associated with a decline in patient "no-show" rates (missed appointments) and about 5,000 fewer telephone calls to Geisinger clinics per month (since 90 percent of electronic messages avoid a phone call), leading to improved productivity for physicians and office staff.

Geisinger has collaborated with other regional caregivers and institutions to form a regional health information exchange to link providers electronically. The exchange now includes 10 hospitals and other caregiver support systems (home health services and senior assisted-living centers). More than 2,000 non-Geisinger users (physicians and their practice staff) have been granted online access (with appropriate patient permission) to Geisinger's EHR for their patients who are treated in Geisinger facilities.

CARE COORDINATION AND TRANSITIONS: TOWARD GREATER ACCOUNTABILITY FOR TOTAL CARE OF THE PATIENT

Geisinger Clinic and Geisinger Health Plan are partnering to test an advanced medical home model (ProvenHealth Navigator) and to redesign care processes so that the primary care team can reliably meet the comprehensive care needs of patients through more intensive outpatient management.[4] The goal is to

develop a transformative model of care delivery and develop a next-generation medical management capability that draws on best practices to enhance care for patients across all care settings. Implementation of this model has encompassed four key components described below: case management, care systems, information management, and funding/compensation arrangements.

Case Management: Patients receive a risk assessment and those at high risk for complications are assigned to a case manager. These nurse case managers, employed by the health plan, are embedded in primary care practices as integral members of the care teams. They develop and carry out a care plan in coordination with the patient's physician and act as a "personal patient link" to facilitate 24-hour access and smooth transitions in care, provide patient and family education, answer questions, and conduct timely follow-up to prevent exacerbations that can lead to emergency department (ED) visits or hospitalizations. If the case manager sees that a patient with congestive heart failure has gained weight, for example, she/he may institute a diuretic protocol and make follow-up contacts as needed.

To help reduce hospital readmissions, case managers telephone high-risk patients 24 to 48 hours after hospital discharge to assess their status, review their care plan and medications, and confirm or make follow-up appointments including a primary care visit four to seven days after discharge. If the patient is readmitted, the care is analyzed to determine how the readmission might have been prevented.

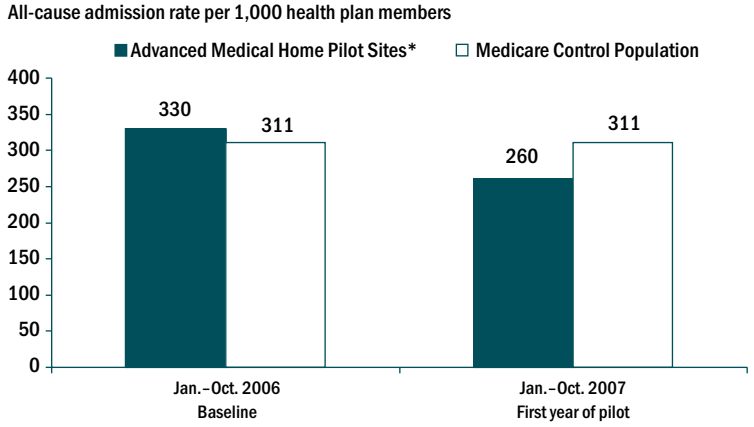
Care Systems: Consistent achievement of improved results requires both technological and organizational systems for identifying high-risk patients, proper sequencing of care processes, grouping of tasks to assure comprehensive care and ease compliance, and measurement of results along with process analysis for efficiency and effectiveness. Such systems include home-based telemonitoring and automated voice-response surveillance of high-risk patients, notification of and communication with the primary care physician after an ED visit or hospitalization, partnerships with skilled nursing facilities for onsite acute care patient management, and EHR templates and decision-support tools such as predefined order lists, best-practice alerts, and patient-specific after-visit summaries.

Information Management: Building the ProvenHealth Navigator advanced medical home model requires actively engaging the care team to promote awareness and understanding of expected behaviors, processes, and goals. This in turn requires integrating clinical knowledge, change management, and data reporting (using both the EHR and insurance data) to establish the link between clinical behaviors, process changes, and results. Because of the lag time involved in collecting and reporting quantitative data, change is also facilitated through patient-specific case reviews and clinical anecdotes.

Funding/Compensation: The health plan provides financial incentives for physicians to participate in the advanced medical home. These include a time-limited, $1,000-per-month stipend to promote skills development and office redesign, and expanded quality incentives to promote improved performance on jointly agreed-upon metrics. The plan also hires and trains the nurse case managers and provides support for analytic decision-making and improved information and communications infrastructure. To qualify for the stipend, physicians must demonstrate engagement in the process, as determined by local practice leaders.

The ProvenHealth Navigator was pilot-tested in two Geisinger Clinic sites among 3,000 of Geisinger Health Plan's Medicare members. Preliminary results include increased use of the online patient portal, increased patient adherence to prescriptions and greater use of generic drugs, increased compliance with bundles of evidence-based care practices for diabetes and coronary artery disease, and a slowing in the utilization of skilled nursing facilities. The all-cause hospital admission rate declined by about 20 percent at the two pilot sites from 2006 to 2007, while there was no change in the admission rate among other Medicare health plan members during that time (Exhibit 4). These

Exhibit 4. Geisinger Health System: Hospital Admission Rates in ProvenHealth Navigator Advanced Medical Home Pilot Sites



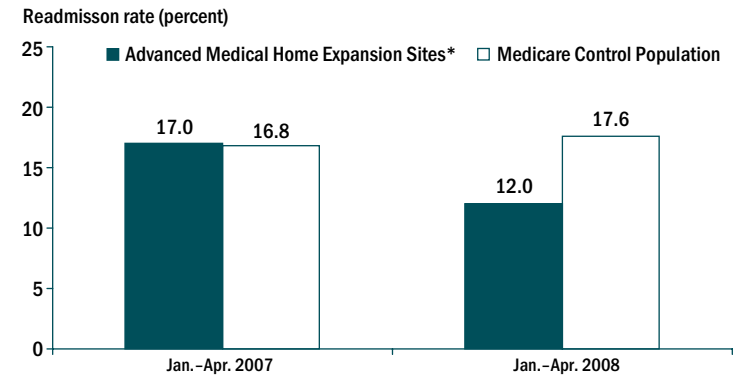
*Note: Advanced medical home (ProvenHealth Navigator) pilot sites included two Geisinger Clinic primary care sites. The patient population included Medicare beneficiaries enrolled in Geisinger Health Plan. The control group included Medicare health plan members who did not receive care at these sites.
Source: Geisinger Health System.

improvements contributed to a 7 percent savings in medical costs among participants at the two pilot sites.[5]

The advanced medical home model has since been expanded to the care of approximately 25,000 Medicare beneficiaries (managed care and fee-for-service patients) who receive their care at 21 Geisinger Clinic primary care sites and four non-Geisinger primary care sites. Example results include a five-percentage-point decrease (29% relative reduction) in the hospital readmission rate among a subset of 15,000 Geisinger Health Plan Medicare members who received care at 11 of these sites from 2007 to 2008, compared with an almost one-percentage-point increase (4% relative increase) among a control group of Medicare health plan members who did not receive services at these sites (Exhibit 5). Overall medical costs have declined by about 4 percent at these sites since they implemented the medical home model.

Geisinger Health Plan also offers disease management programs for conditions including asthma, chronic obstructive pulmonary disease, congestive heart failure, coronary heart disease, diabetes, hypertension, osteoporosis, and chronic kidney disease. Nurse case managers are assigned to one or more

Exhibit 5. Geisinger Health System: Hospital Readmission Rates in ProvenHealth Navigator Advanced Medical Home Expansion Sites



*Note: Advanced medical home (ProvenHealth Navigator) expansion sites included 10 Geisinger Clinic primary care sites and one non-Geisinger primary care practice at the time of the analysis. The patient population included 15,000 Medicare beneficiaries enrolled in Geisinger Health Plan. The control group included Medicare health plan members who did not receive care at these sites.
Source: Geisinger Health System.

contracted primary care practices to conduct patient education, facilitate referral to specialty clinics as needed, and promote adherence to evidence-based care guidelines. The health plan has documented improvements in care processes and cost savings of over $100 per member per month from reductions in avoidable hospital use (25% fewer admissions and 43% fewer hospital days) among participating diabetes patients (Exhibit 6).[6] These disease-specific programs are being converted to a population-management approach to support the advanced medical home model as the ProvenHealth Navigator program is disseminated throughout the Geisinger Health Plan primary care network.

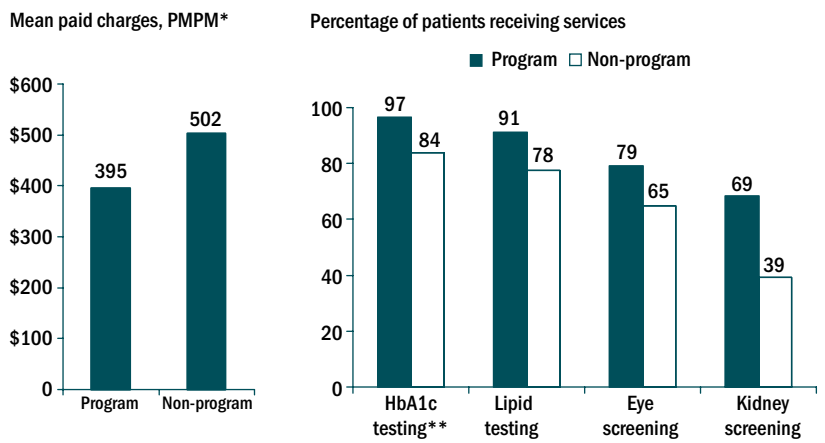
PEER REVIEW AND TEAMWORK FOR HIGH-VALUE CARE

Harnessing Culture and Incentives to Foster Higher Performance: Geisinger's leaders found that bringing its physicians together in 22 cross-disciplinary service lines (each led by one physician and one administrator) to plan, budget, and evaluate one another's performance created a team-oriented transformation in the organization's culture. In Geisinger's experience, this interdisciplinary model promotes the achievement of higher levels of performance and gives it a competitive advantage in the marketplace and in attracting and retaining physicians.

Geisinger uses internal incentives and recognition to drive improvements in performance. Base compensation for physicians is tied to productivity. About 15 percent to 20 percent of total compensation is based on meeting performance targets including budget, quality of care, patient satisfaction, and citizenship activities such as teaching and committee work. Since the roll-out of this compensation plan five years ago, improvements have been seen in productivity (from the 45th percentile to the 78th percentile using the McGladrey Standard for large clinics) and in patient satisfaction, with 20 percent of Geisinger physicians placing nationally in the top-performing decile of their peers.

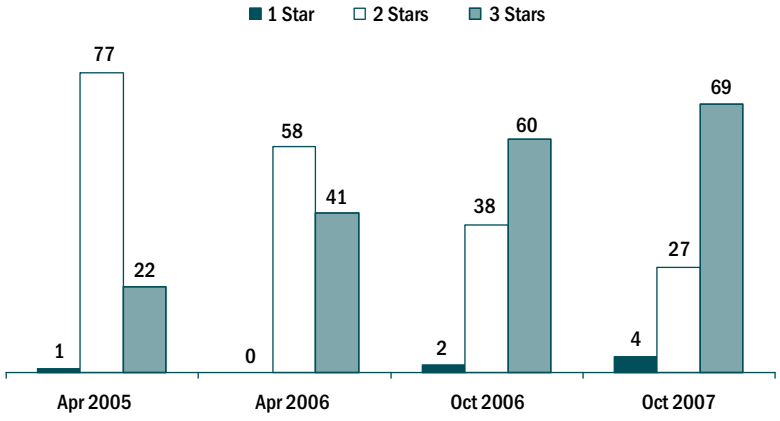
In 2005, Geisinger Health Plan introduced the Web-based Physician Quality Summary, which compares the performance of contracted primary care practice sites on nine clinical quality and patient service metrics using a three-star rating system. Practices that achieve three-star rankings are eligible for financial rewards. From 2005 to 2007, Geisinger primary care clinic sites increased their three-star rankings threefold (from 22% to 69% of their rankings) as a result of improvements driven by systems such as patient registries and automated preventive care notifications (Exhibit 7). There was little change in rankings of non-Geisinger-contracted sites during this time, with their three-star rankings remaining at about 6 percent to 7 percent.[7]

Exhibit 6. Geisinger Health Plan: Benefit of Disease Management Program to Patients with Diabetes



* PMPM = per member, per month.
** HbA1c = hemoglobin A1c.
Source: J. Sidorov, R. Shull, J. Tomcavage et al., "Does Diabetes Disease Management Save Money and Improve Outcomes?" *Diabetes Care*, April 2002 25(4):684–89.

Exhibit 7. Geisinger Health System: Physician Quality Summary* Ranking for Primary Care Sites



*Note: The Geisinger Health Plan Physician Quality Summary is a semiannual, Web-based primary care reporting system, with nine clinical- and service-related quality metrics ranked from one to three stars.
Source: S. B. Pierdon and T. R. Graf, "Advanced Medical Home: Leveraging Concepts and Data to Enhance Quality." Presented at the American Medical Group Association Annual Conference, Orlando, Fla., March 6–8, 2008.

Improving Outcomes by Ensuring the Reliable Performance of Acute Care Procedures: ProvenCare is Geisinger's portfolio of evidence-based quality and efficiency programs addressing both acute and chronic conditions; many are also packaged-priced products based on outcome measures. Care processes have been redesigned to reliably deliver a coordinated bundle of evidence-based (or consensus-based) best practices. For Geisinger Health Plan members having certain surgical procedures, Geisinger charges a flat fee that includes preoperative care, surgery, and 90 days of follow-up treatment (at a Geisinger facility) including that of related complications. Pricing the bundle at a discount creates an incentive for efficiency and, in effect, offers a warranty against complications.[8]

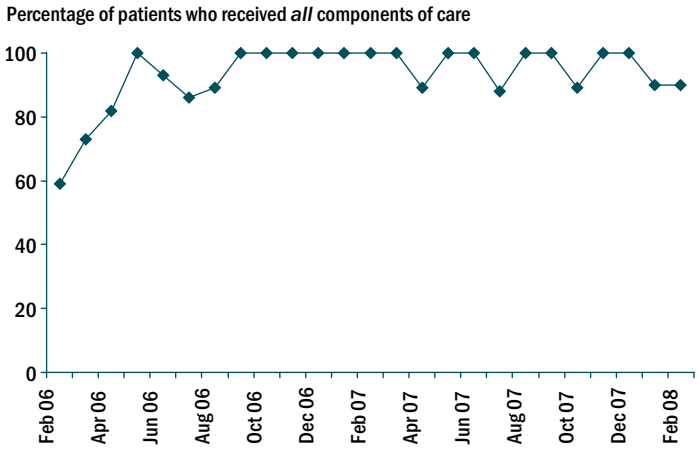
For heart bypass surgery (coronary artery bypass graft), the initial ProvenCare product, clinical workgroups established a bundle of 40 evidence-based practices, developed an improved workflow process with identified points of accountability, and worked with information systems professionals to "hardwire" each element of the bundle into the EHR through templates, order sets, and reminders. The process also includes a "patient compact" to convey the expectation that patients should be active partners in their own care. As a result of these efforts, adherence to the bundle of 40 evidence-based practices increased from 59 percent at baseline to 100 percent after four months and has remained at or close to that level indicating a relatively stable process (Exhibit 8). Improved process of care was associated with improved clinical outcomes including:

- 100 percent lower in-hospital mortality (which decreased from 1.5% to zero);
- 21 percent decrease in patients with any complications (from 38% to 30%);
- 45 percent decrease in readmissions within 30 days (from 6.9% to 3.8%); and
- 10 percent increase in patients discharged to their homes.

Financial outcomes also improved, including a 16 percent drop in average length of stay (from 6.3 days to 5.3 days) and 5 percent lower hospital charges.[9]

The ProvenCare product portfolio has been expanded to include angioplasty, hip replacement, cataract surgery, erythropoietin use, bariatric surgery, angioplasty with acute myocardial infarction, and perinatal care. A similar management program for biologics is also being developed. Geisinger also has created chronic disease programs based on the same principles of high reliability that underlie its ProvenCare program. These programs address diabetes, congestive

Exhibit 8. Geisinger Health System: ProvenCare Coronary Artery Bypass Graft Process Reliability



Source: Geisinger Health System.

heart failure, coronary artery disease, hypertension, and disease prevention.

CONTINUOUS INNOVATION

Building an Innovation Infrastructure: Geisinger's leaders believe that the organization can simultaneously improve quality, satisfaction, and efficiency only by redesigning and reengineering how care is delivered, and not by trying to make people work harder the traditional way. Building on the strengths of its integrated system, the organization typically begins its efforts by targeting Geisinger patients insured by Geisinger Health Plan, in whose treatment clinical and financial responsibilities intersect. Once a model is proven, the innovation may be expanded to encompass additional patients or groups. In a recent article, Geisinger's executive vice president and chief technology officer, Ronald Paulus, M.D., M.B.A., and coauthors described the key elements of Geisinger's "innovation architecture" as follows[10]:

- convening teams of diverse stakeholders to identify the best care model for enhancing value in the prevention and treatment of disease;
- setting targets for care model redesign based on factors such as impact on populations and cost, variation in outcomes, interest among physicians, and gaps in performance;
- developing a clinical business case for the redesign including identifying efficiency and quality goals and developing a road map of needed changes and linkages in processes, analytic support, and financial and non-financial incentives;
- applying a variety of improvement approaches, including borrowing and adapting approaches that have worked in previous initiatives; and
- culling promising innovations for expansion.

Redesigning Ambulatory Care Processes for Higher Reliability: Geisinger uses the ProvenCare model to identify "bundles" of evidence-based processes and metrics as part of redesign efforts to promote improved performance in several areas of ambulatory care, including pediatric and adult immunizations, adult diabetes, coronary artery disease, congestive heart failure, hypertension, and adult preventive care. The EHR supports these improved practices through automatic health-maintenance and best-practice alerts to the physician, automatic patient-reminder letters, drug–drug interaction and drug–allergy warnings, laboratory test alerts, notice of drug and vaccine recalls, and other decision-support tools. Exemplary results include the following:

- Compliance with a bundle of nine diabetes measures nearly tripled (from 2.4% to 6.5% of diabetes patients) during a one-year period when a disease registry derived from the EHR was used to provide electronic reminders to physicians in combination with performance feedback and financial incentives.[11] Some measures increased to an even greater degree, e.g., the pneumococcal vaccination rate rose from 57 percent to 81 percent.
- Electronic medication alerts have led to increased use of generic drugs, with estimated savings of $1,000 per year per physician.

Another example of process redesign to test and prove new approaches for meeting patients' preventive care needs is an outreach campaign targeting elderly women at risk of developing osteoporosis.[12] The EHR identified eligible patients—women over age 65 who were not taking osteoporosis medications and had not received a bone mineral density (DXA) scan in the last two years—in two Geisinger primary care clinics. These women each received a personalized letter from a rheumatologist explaining the importance of screening and encouraging them to schedule an appointment for a DXA scan. Those who did not respond to the letter received a follow-up phone call from a nurse. Women identified by the scan as being at high risk of osteoporosis were invited to a group medical visit that included a two-hour educational session with a rheumatologist and nurse followed by a physical exam. Results included the following:

- Almost half (49%) of women in the intervention clinics scheduled a DXA scan, as compared with 13 percent of women in two control clinics.
- Women attending the group follow-up visit were more likely to receive medication to reduce their risk of bone fractures than were women who opted for follow-up care with their physician (100% vs. 69%) and were also more likely to be assessed for vitamin D deficiency (100% vs. 3%) and given a prescription for vitamin D and calcium (97% vs. 50%).

Improving Medication Safety: Geisinger recently initiated a program to improve patient safety by reducing the use of dangerous (potentially confusing or unclear) abbreviations in medication orders and by improving medication reconciliation, which is a process to assure an accurate medication list at "handoffs" such as hospital admission and discharge. This effort involved redesigning care processes to enhance communication, "hardwiring" the medication list update into nursing workflows, using the EHR to alert physicians when they use a dangerous abbreviation, regularly monitoring and reporting on progress, and reeducating top offenders. In the first six months of the program, the use of dangerous abbreviations in outpatient orders fell from 5,000 per month to 1,000 per month.

> "We're applying a quality and value product to everybody, regardless of the insurance. All of the reengineering and redesign of patient care accrues to the benefit of every single patient."
>
> *Geisinger CEO Glenn Steele, Jr., M.D., Ph.D.*

EASY ACCESS TO APPROPRIATE CARE

Geisinger recently completed the first phase of an advanced access redesign of its clinic appointment system, which grew out of its participation in an Institute for Healthcare Improvement collaboration called the Idealized Design of Clinical Office Practice. Following a successful test in two pilot sites, a work group developed an implementation plan that emphasized local initiative by providing education, training, and support to improvement teams at each site. As a result of these efforts, same-day appointments in primary care sites increased from 50 percent in 2002 to 95 percent in 2006, and 84 percent of network sites now have a lead time of one day or less. Improved access has been associated with a 48 percent increase in patient satisfaction (across the network) and an 8 percent increase in physician productivity.[13]

During 2006, Geisinger began opening walk-in CareWorks clinics in area grocery stores. Staffed by nurse practitioners and physician assistants, these clinics offer extended hours and handle routine treatment for minor illnesses, health screenings, immunizations, and common laboratory tests, with an average total cost of $55 per visit. Providers coordinate care with the patient's personal physician using the system's EHR and offer all patients an opportunity to register with MyGeisinger for remote Web access to their medical record.

Exhibit 9. Selected Externally Reported Results and Recognition*

Inpatient Care Quality[14] (CMS Hospital Compare Jan.–Dec. 2007)	*Four-topic clinical composite* (24 measures): Geisinger Medical Center ranked in the top quartile of U.S. hospitals evaluated. *Heart attack treatment* (8 measures): Geisinger Medical Center ranked in the top decile of U.S. hospitals evaluated. *Overall patient rating of care* (HCAHPS): Geisinger Medical Center ranked in the top quartile of all U.S. hospitals and of large hospitals reporting.
Ambulatory Care Quality (NCQA Quality Compass 2008)	*Clinical quality* (34 measures): Geisinger Health Plan ranked in the top quartile of commercial health plans nationally or regionally on 21 measures, 12 of which were in the top decile. *Patient experience* (10 measures): Geisinger Health Plan ranked in the top quartile of commercial health plans nationally or regionally on eight measures, six of which were in the top decile.
National Recognition and Ratings	*Verispan Top 100 Integrated Health Networks* (2005–2008). *Hospitals and Health Networks Top 100 Most Wired* (2006–2009). *Thomson/Solucient 100 Top Hospitals*: National Benchmarks for Success (Geisinger Medical Center in 2005 and 2006; Geisinger Wyoming Valley Medical Center in 2004); Performance Improvement Leaders (Geisinger Medical Center in 2003 and 2005). *National Research Corporation Consumer Choice Award*: Geisinger Wyoming Valley Medical Center in 2006/2007. *National Committee for Quality Assurance:* Health Plan Excellent Accreditation; Quality Plus Distinction in Care Management and Health Improvement; Disease Management Patient and Practitioner Full Accreditation; Diabetes Physician Recognition Program (Geisinger Clinic Primary Care Network and Endocrinology Dept.). *US News & World Report Best Health Plans:* Geisinger Health Plan ranked among the top 50 commercial plans in 2005, 2007, and 2008 and among the top 25 Medicare plans in 2007 and 2008. *JD Power and Associates National Health Insurance Plan Study:* Geisinger Health Plan ranked in the top quartile of 128 commercial health plans evaluated nationally in 2009. *American Medical Group Association:* Preeminence Award (2007).

* See the Series Overview, Findings, and Methods for analytic methodology and explanation of performance recognition. CMS = Centers for Medicare and Medicaid Services; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems (large hospitals means 300 or more beds and patient surveys); NCQA = National Committee for Quality Assurance (Quality Compass 2008 represents the 2007 measurement year).

RECOGNITION OF PERFORMANCE

In addition to the results of the specific interventions described above, Geisinger Health System has achieved notable results on selected externally reported performance indicators and has received recognition for its performance on several national benchmarking or award programs (Exhibit 9). In terms of efficiency, data from the *Dartmouth Atlas of Health Care*, which examined care at the end of life for Medicare patients with chronic illness, indicate that those who received the majority of their care at Geisinger Medical Center from 2001 to 2005 had relatively lower Medicare spending per person (83%) and fewer hospital days (64%) and physician visits (73%) compared with the U.S. average.[15]

The identification of areas of excellence does not mean that Geisinger has achieved perfection, however. Like the other organizations in this case study series, Geisinger has room for improvement in several areas of care. For example, 30-day mortality among Medicare patients with pneumonia was higher than the national average at Geisinger South Wilkes Barre Hospital in 2006–2007, as reported on the Centers for Medicare and Medicaid Services' Hospital Compare Web site. Geisinger's track record of improvement suggests that the organization will address such issues and continue to innovate so as to achieve higher performance over time.

INSIGHTS AND LESSONS LEARNED

Geisinger's leaders attribute the organization's success in improving its performance to three main factors: 1) a vision of becoming a national model for care delivery as an engine of innovation; 2) leadership to achieve that vision reinforced with a compensation system that is aligned toward specific goals every year in a strategic planning process; and 3) timely feedback of information on progress toward goals. In short, "alignment, reinforcement, and ability to measure and correct in near real time," said chief medical officer emeritus Bruce Hamory, M.D. Physician leadership of improvement initiatives, coupled with a group culture that emphasizes interdisciplinary collaboration, fosters a "pride of purpose" among physicians that aligns the professional desire for enhancing reputation with the organization's goals for improvement, according to Geisinger's CEO, Glenn Steele, Jr., M.D., Ph.D.

Geisinger's experience instituting a performance-based compensation system shows how the organization provides explicit reinforcement for a culture of excellence. The compensation system was implemented over seven years by reconfiguring pay increases to incentives rather than through salary reductions. Nevertheless, the organization sustained a higher rate of turnover among physicians and leaders early in the process of making this change—a cost that the organization was willing to bear to enhance its organizational culture of high performance.

Developing a specific innovation such as the ProvenCare program required a large organizational commitment of resources. To specify a highly reliable process, Geisinger's physicians had to translate the general principles found in clinical guidelines into specific measurable process steps and behaviors for the care team. In a discussion forum, Geisinger surgeon Alfred Casale, M.D., explained the effort this way:

> The [professional] guidelines for coronary grafting are about as good as any guidelines we have focusing on surgical procedure. But even they are very general, almost like 'eat your vegetables.' It is hard to measure that. We then translated those generalizations into specifics like 'eat 2 cups of broccoli every 24 hours,' because that could be measured…and followed.[16]

Having an open and integrated delivery system enables Geisinger to create incentives and innovations that can drive higher performance, both internally and externally. Redesigned care processes such as ProvenCare and the advanced medical home can be codesigned and incentivized by the health plan, yet the benefits accrue to all of Geisinger's patients, not just those enrolled in the health plan. "We're applying a quality and value product to everybody regardless of the insurance," Steele said. "All of the reengineering

and redesign of patient care accrues to the benefit of every single patient."

Similarly, a mixed-health-plan provider network allows Geisinger to collaborate with and influence care practices in non-Geisinger physician groups and hospitals (Geisinger patients account for 40 percent or more of the patient volume in 13 non-Geisinger hospitals). For example, placing nurse case managers employed by the health plan into both Geisinger and non-Geisinger primary care practices extends the system's integration and efficiency outside its organizational boundaries. This arrangement allows collaborative follow-up and performance reporting using the system-wide EHR.

Geisinger is seeking to demonstrate greater value in the care it provides to purchasers (private and public) as a market-based proof of principle and in the belief that Medicare reimbursement will move toward continuum-of-care payment and outcomes-based reimbursement. This transformation will require real-time information and electronic linkages of the kind that Geisinger is developing. Given Geisinger's unique market, its leaders view the organization's ability to create efficiencies as an opportunity to increase system capacity and avoid making unnecessary capital expenditures for new facilities as demand for services continues to rise with an aging population.

For a complete list of case studies in this series, along with an introduction and description of methods, see *Organizing for Higher Performance: Case Studies of Organized Health Care Delivery Systems—Series Overview, Findings, and Methods,* available at www.commonwealthfund.org.

NOTES

[1] T. Shih, K. Davis, S. C. Schoenbaum, A. Gauthier, R. Nuzum, and D. McCarthy, *Organizing the U.S. Health Care Delivery System for High Performance* (New York: Commonwealth Fund Commission on a High Performance Health System, Aug. 2008).

[2] Information on Geisinger Health System was synthesized from a telephone interview with the individuals named in the acknowledgments; from presentations by Steven Pierdon, M.D., Thomas Graf, M.D., Frederick Bloom, Jr., M.D., and Mark Selna, M.D., at the American Medical Group Association 2008 Annual Conference, Orlando, Fla., March 2008; from information from the organization's Web site (www.geisinger.org), and from other sources noted below.

[3] A summary of findings from all case studies in the series can be found in D. McCarthy and K. Mueller, *Organizing for Higher Performance: Case Studies of Organized Delivery Systems—Series Overview, Findings, and Methods* (New York: The Commonwealth Fund, 2009).

[4] Information in this section was drawn in part from S. B. Pierdon and T. R. Graf, "Advanced Medical Home—Leveraging Concepts and Data to Enhance Quality," a presentation at the American Medical Group Association 2008 Annual Conference, Orlando, Fla., March 2008.

[5] R. A. Paulus, K. Davis, and G. D. Steele, "Continuous Innovation in Health Care: Implications of the Geisinger Experience," *Health Affairs*, Sept./Oct. 2008 27(5):1235–45.

[6] J. Sidorov, R. Shull, J. Tomcavage et al., "Does Diabetes Disease Management Save Money and Improve Outcomes?" *Diabetes Care*, April 2002 25(4):684–89.

[7] Pierdon & Graf, "Advanced Medical Home," 2008.

[8] For example: "Out of recognition that not every complication can be eliminated, the episode payment rate [for coronary artery bypass graft surgery] included a discount of 50 percent from the average related postoperative readmission cost experienced in a two-year historical comparison group. As a result, the financial risk of managing increased or unchanged rates of complications was transferred wholly to the clinical enterprise" (Paulus, Davis & Steele, "Continuous Innovation," 2008).

[9] A. S. Casale, R. A. Paulus, M. J. Selna et al., "ProvenCare: A Provider-Driven Pay-for-Performance Program for Acute Episodic Cardiac Surgical Care," *Annals of Surgery*, Oct. 2007 246(4):613–21. Note: Improvement trend in process reliability was statistically significant but only discharge to home was statistically significant among the clinical outcomes described.

[10] Paulus, Davis & Steele, "Continuous Innovation," 2008.

[11] V. Weber, F. Bloom, S. Pierdon et al., "Employing the Electronic Health Record to Improve Diabetes Care: A Multifaceted Intervention in an Integrated Delivery System," *Journal of General Internal Medicine*, April 2007 23(4):379–82.

[12] W. T. Ayoub, E. D. Newman, M. A. Blosky et al., "Improving Detection and Treatment of Osteoporosis: Redesigning Care Using the Electronic Medical Record and Shared Medical Appointments," *Osteoporosis International*, Jan. 2009 20(1):37–42.

[13] S. Pierdon, T. Charles, K. McKinley et al., "Implementing Advanced Access in a Group Practice Network," *Family Practice Management*, May 2004 11(5):35–38.

[14] Three Geisinger hospitals were evaluated on CMS Hospital Compare (only results in the top quartile are noted in the table). Rankings for the four clinical topics (heart attack, heart failure, pneumonia treatment, and surgical care improvement) included hospitals that reported on all measures and recorded at least 30 patients in each topic.

[15] J. E. Wennberg, E. S. Fisher, D. C. Goodman et al., *Tracking the Care of Patients with Severe Chronic Illness: The Dartmouth Atlas of Health Care 2008* (Hanover, N.H.: Dartmouth Institute for Health Care Policy & Clinical Practice, 2008). The analysis focused on the last two years of life among Medicare patients with one of nine chronic conditions who died between 2001 and 2005, controlling for differences in patients' age, sex, race, and primary chronic diagnosis. Data on Geisinger Medical Center are available online at: www.dartmouthatlas.org.

[16] Casale, Paulus, Selna et al., "Provider-Driven Pay-for-Performance," 2007.

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The aim of Commonwealth Fund–sponsored case studies of this type is to identify institutions that have achieved results indicating high performance in a particular area of interest, have undertaken innovations designed to reach higher performance, or exemplify attributes that can foster high performance. The studies are intended to enable other institutions to draw lessons from the studied institutions' experience that will be helpful in their own efforts to become high performers. It is important to note, however, that even the best-performing organizations may fall short in some areas; doing well in one dimension of quality does not necessarily mean that the same level of quality will be achieved in other dimensions. Similarly, performance may vary from one year to the next. Thus, it is critical to adopt systematic approaches for improving quality and preventing harm to patients and staff.