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The Care Redesign Series: Cardiovascular Care Among Leading Health Systems

TheAcademy

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Introduction

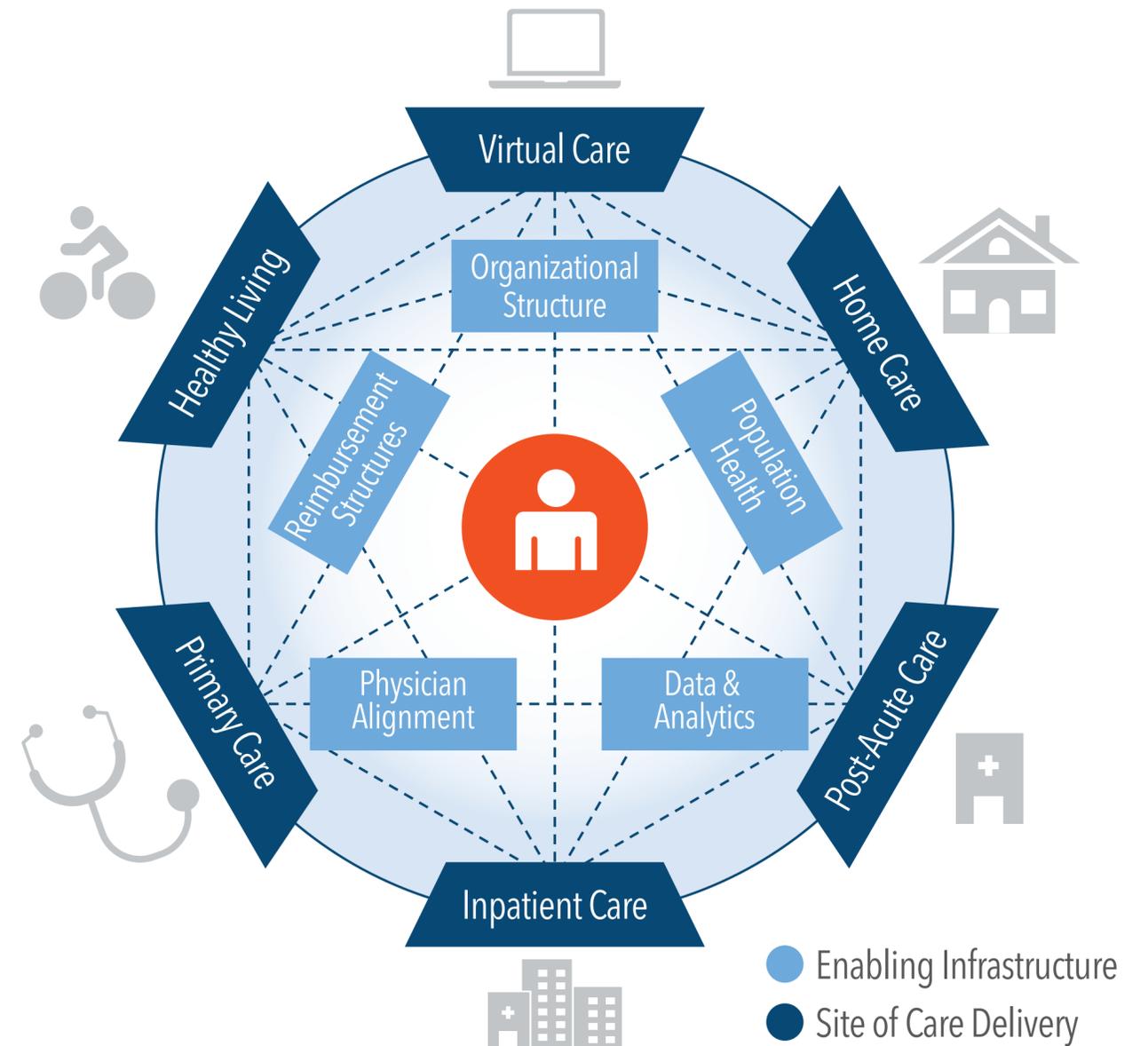
As health systems seek to provide high-quality, cost-effective care amidst a backdrop of accelerated payment reform often emphasizing value over volume, many healthcare providers are reconsidering their approach to patient management. Care redesign is the process of reengineering the delivery of clinical care at the system level with the following strategic goals:

- Improving quality and outcomes;
- Increasing operational efficiency;
- Reducing clinical variation;
- Managing the total cost of care.

Cardiovascular (CV) conditions are not only highly prevalent, but the treatment of these conditions often involves a substantial amount of clinical variation, which has been associated with higher costs, lower quality, and worse outcomes.¹⁻² For CV service line leaders, care redesign requires operationalizing standardized care pathways to reduce clinical variation. For the most part, these pathways are focused on the acute and post-acute care settings, as this is where most of the service line costs are incurred.

However, as Leading Health Systems (LHS) consider a system-wide care redesign strategy, they are beginning to think about all components of the health system in aggregate and how to manage care delivery at scale. Increasingly, this strategy targets settings outside of the service line and the enabling elements that connect these various care settings. All of these components are interconnected, and each is ripe with opportunities to innovate under the umbrella of care redesign.

The Care Redesign Framework

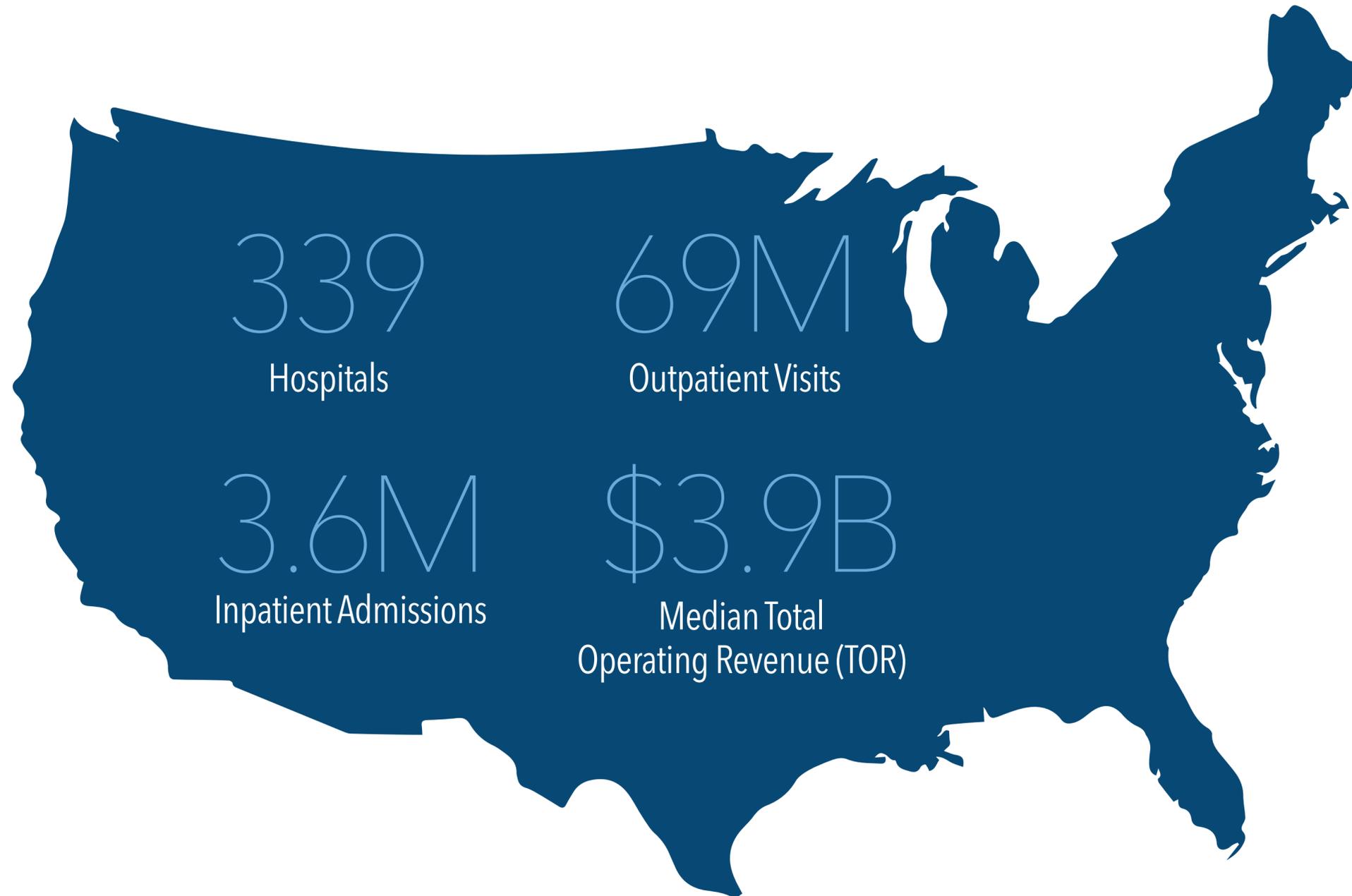


¹ Lee, Vivian S., Kensaku Kawamoto, Rachel Hess, Charlton Park, Jeffrey Young, Cheri Hunter, Steven Johnson et al. "Implementation of a value-driven outcomes program to identify high variability in clinical costs and outcomes and association with reduced cost and improved quality." *Jama* 316, no. 10 (2016): 1061-1072.

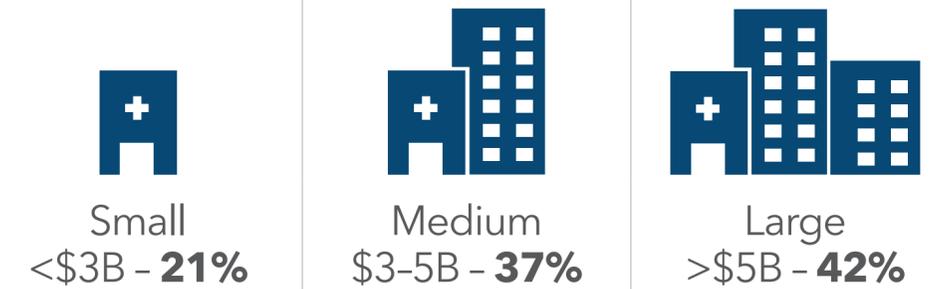
² Dulac, Jennie. "Using severity-adjusted control charts to eliminate clinical variation, drive lower costs and improve care." *Management in Healthcare* 3, no. 2 (2018): 144-152.

Representing Leading Health Systems

The 19 Participating Health Systems Represent a Significant Share of the US Healthcare Market



Health System Size (NPR)



Respondent Roles

- VP, Heart Institute
- VP, Service Lines
- VP, Strategy
- VP, Medical Affairs
- Regional Chief Medical Officer
- Medical Director, CV Service Line
- Executive Director, Heart and Vascular Services
- Chief, CV Medical Group

All data and findings included in this report are reflective of survey responses from executives at Leading Health Systems. The sample size remains consistent throughout the report, in which quantitative survey data (N=13) is combined with qualitative insights (N=14) to provide perspectives for 19 unique health systems. For additional methodology details, see page 35 of this report.

Key Findings

1 Structures Enabling Care Redesign

Many system-level service line leaders recognize that care redesign initiatives require the optimization of their organizational structure as a foundation, and these efforts are further facilitated by value-based reimbursement structures, physician alignment, population health, and data and analytics.

2 Challenges and Approaches Across Care Settings

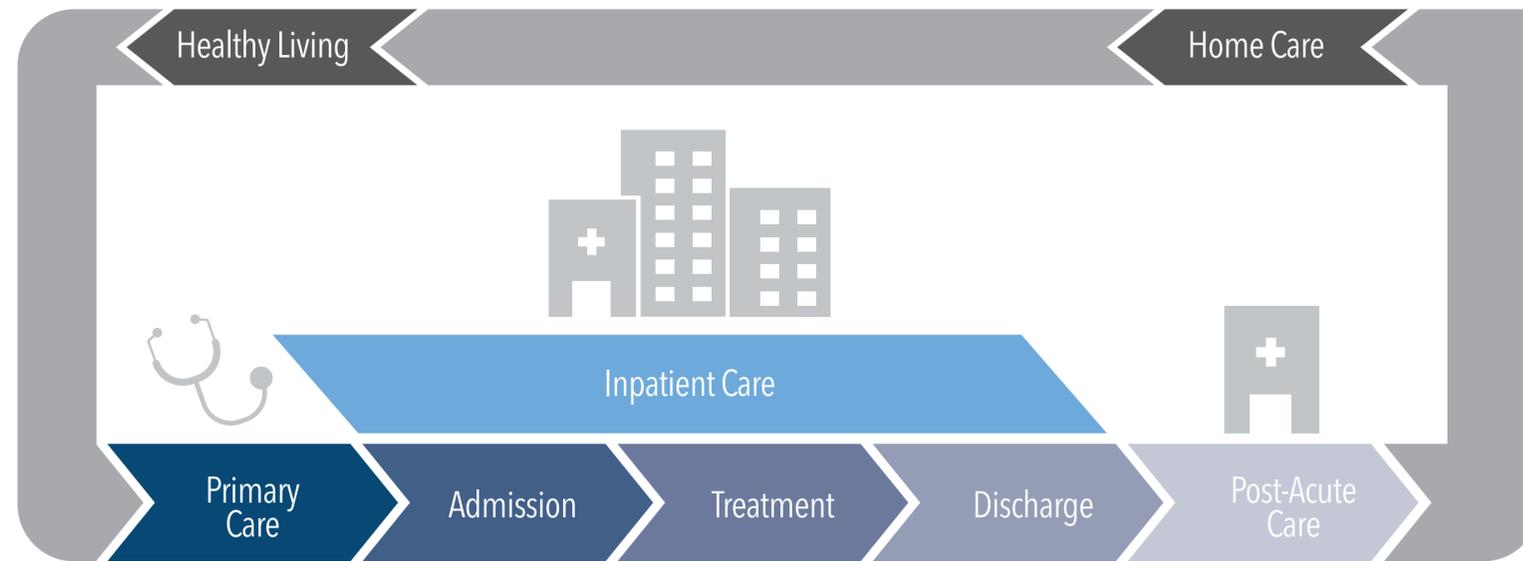
As the reduction of clinical variation is seen as a large challenge for LHS, many of these systems are creating standardized care pathways predominantly focused on the inpatient and post-acute settings, while increasingly seeking to improve coordination in care delivery across ambulatory, home, and virtual care settings as well.

3 Informed Practices for Care Redesign

Whereas health systems are at different stages of maturity in the development of a cohesive strategy for system-wide care redesign, most health systems have limited their current focus to a handful of initiatives, particularly those beyond the acute care setting.

Structures Enabling Care Redesign

CV Care Delivery Framework is Evolving



Traditional Delivery Focuses on Inpatient Care

In the current paradigm of CV care delivery, the service line is often focused on the patient's journey and various touchpoints with the health system. This journey is often seen as a cycle, and much of the attention in this cycle is concentrated on the acute care setting. Correspondingly, a majority of care standardization initiatives to date have concentrated on inpatient care.

Care Redesign Recognizes Importance of Enabling Infrastructure

Through the lens of care redesign, however, there is equal importance placed on all care settings. Each care setting constitutes a unique opportunity to innovate and identify areas for improvement with respect to patient care. Additionally, the cross-continuum elements that connect each care setting are vitally important. A comprehensive care redesign strategy encompasses this "enabling infrastructure" as well.



Perceived Prioritization of CV Care Redesign is High

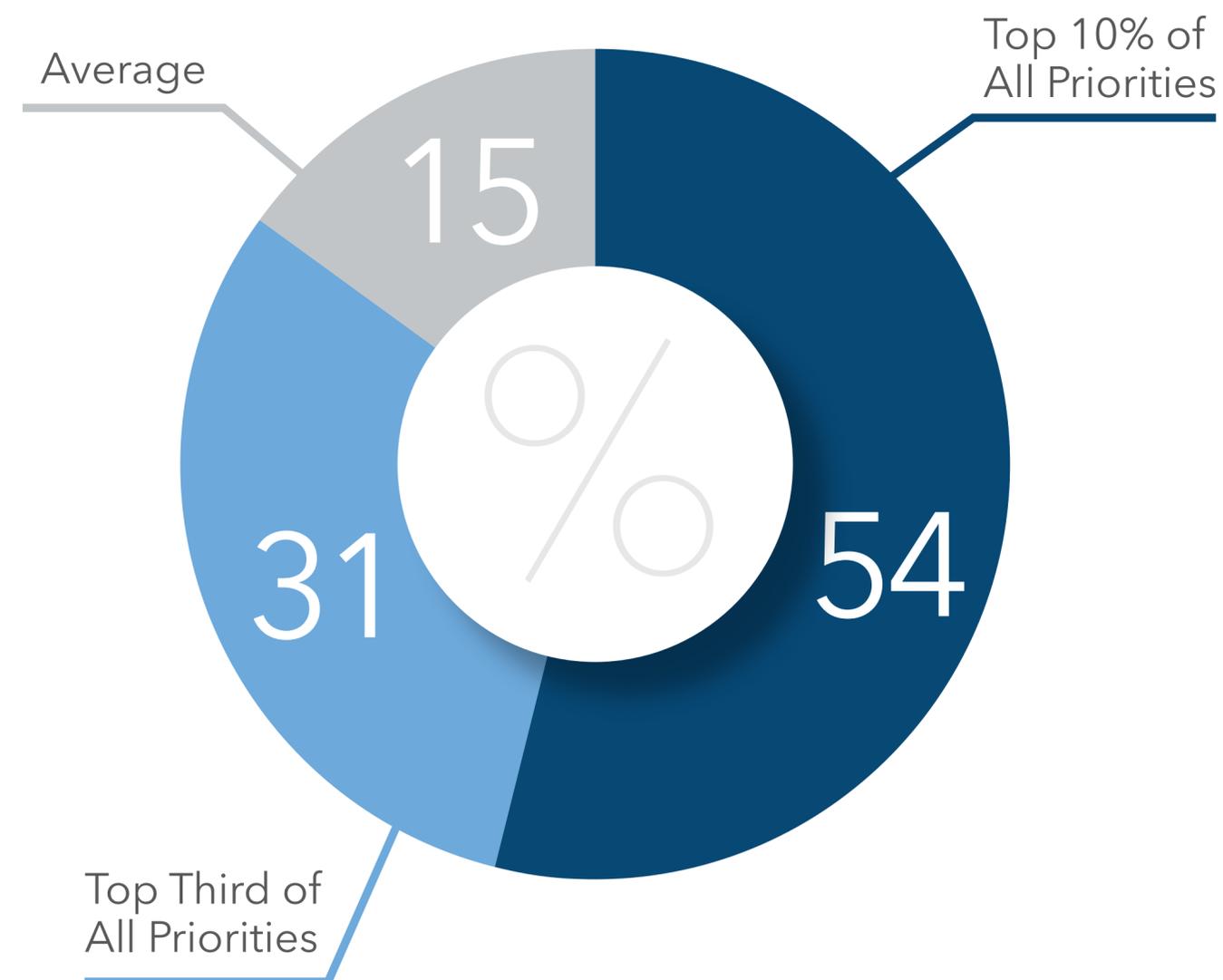
Priority Level for CV Care Redesign is High Among C-Suite

More than half of CV service line leaders (54%) feel that CV care redesign ranks among the top 10% of all C-suite level priorities. Another 31% indicate that redesign is among the top third of all C-suite priorities. Altogether, this indicates a strong willingness of high-level executives to recognize and prioritize initiatives that fall within the scope of CV care redesign across LHS.

New Definitions of Care Redesign Incorporate Macro-Level Redistribution of Services and Procedures

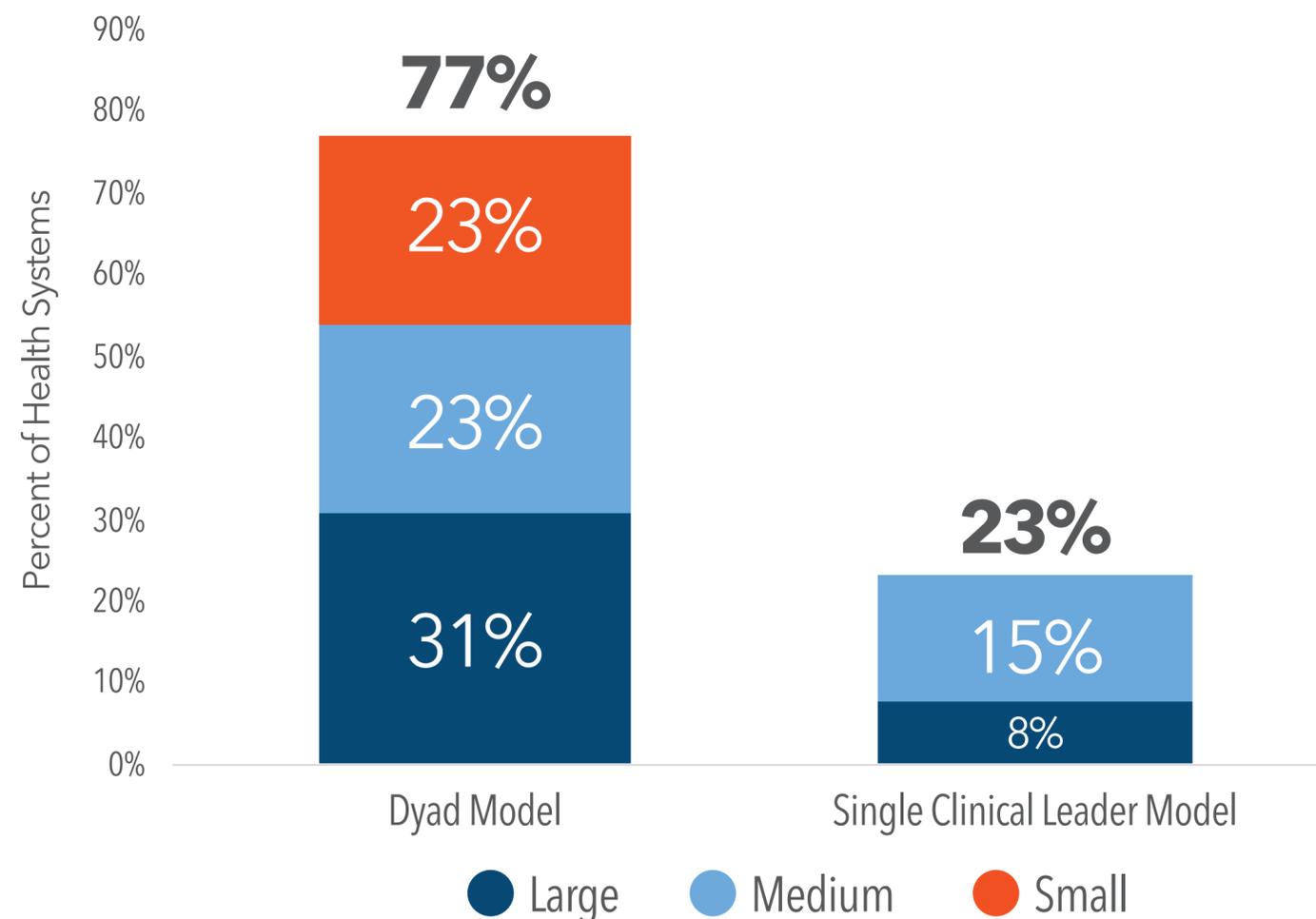
The high prioritization of CV care redesign can be explained by a new dimension that health systems are increasingly considering in their definition of care redesign: the macro-level redistribution of subspecialties and high-cost services. This type of strategic initiative looks at the health system in aggregate with the goal of evaluating the availability of subspecialties and procedures within a given geography and reallocating them as necessary. This is part of a broader strategy to manage cost and improve the financial viability of the health system at scale, especially as consolidation continues to occur and health systems seek to create a "hub and spoke" model for all specialty care.

Perceived C-Suite Prioritization Of CV Care Redesign



Most Leverage a Dyad Model for CV Leadership

System-Wide CV Service Line Leadership Structure



CV Service Line Leader Strategy Focuses Predominantly on the Inpatient and Post-Acute Settings

As LHS begin to think about the CV service line in the context of their overarching system-wide strategy, they have implemented leadership structures that allow centralized decision-makers to influence CV strategy across the health system. However, these leaders commonly dictate strategy in the inpatient and post-acute care settings. Care strategies that encompass ambulatory care are not often within the purview of these leaders.

Dyad Models of Leadership are Most Common Among LHS

For 77% of participating health systems, there is a dyad – one clinical and one administrative leader – that shares the responsibility of developing and owning CV care initiatives across the organization. Notably, all small health systems have a dyad structure.

One health system chose to eliminate its dyad model in favor of a single clinical leader. Senior executives feel that they can onboard other service lines faster under this model and make the service line less dependent on the synergy of co-leaders. Regardless of structure, service line leaders are all working toward creating the optimal organizational structure upon which to implement care redesign initiatives (CRIs).

“Legacy reporting structures and organizational impediments prevent us from realizing the full effect of value improvement initiatives.” - VP, Heart Institute

Cost and Performance Dictate Need for Care Redesign

Excess Costs and Subpar Performance are Strong Drivers of Care Standardization

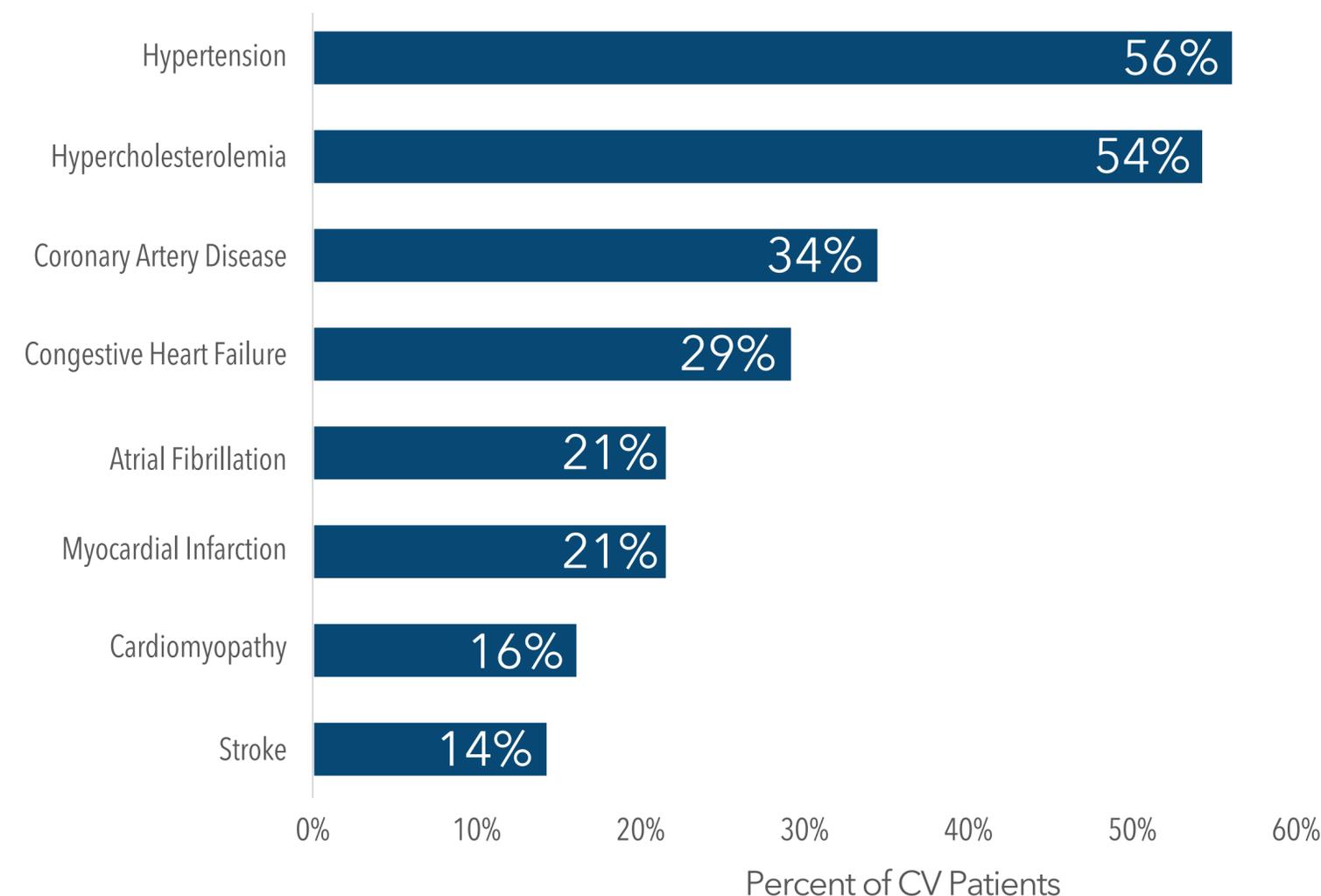
While the prevalence of CV conditions among a health system’s patient population helps to indicate the need for care standardization, the overall cost of care and subpar performance compared to national benchmarks are stronger motivations to create care pathways among CV service line leaders.

The two most prevalent conditions, hypertension and hypercholesterolemia (high cholesterol), do not often have standardized care pathways within the CV service line. This is likely due to the fact that primary care physicians (PCPs) are predominantly responsible for the management of patients with these conditions. Moreover, the treatment of patients with these conditions is seen as preventive and ultimately not as high cost to the health system.

Health systems have most commonly prioritized creating CV care pathways for patients with the following conditions, in order of commonality:

- Coronary artery disease (CAD);
- Congestive heart failure (HF);
- Atrial fibrillation (Afib);
- Acute myocardial infarction (AMI).

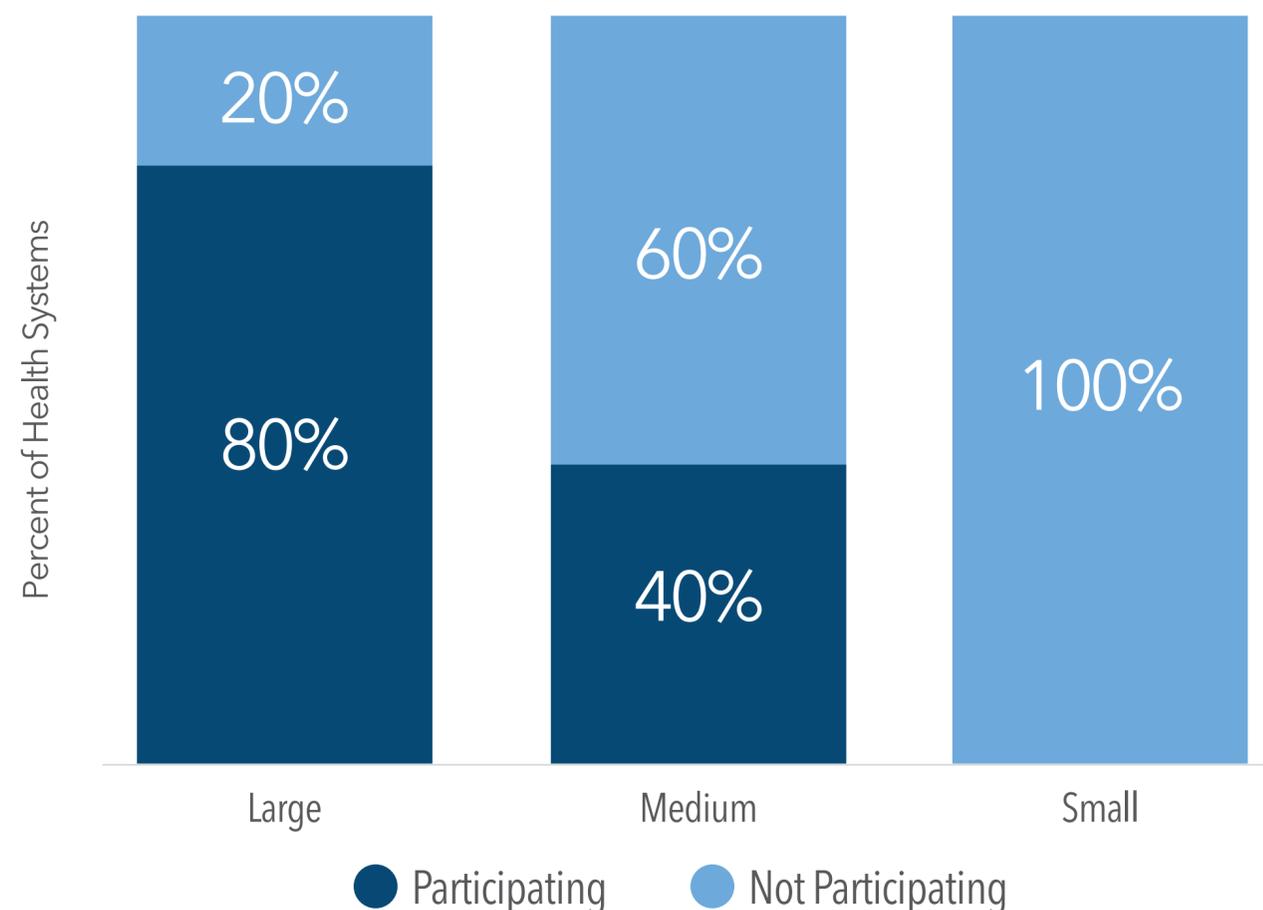
Prevalence of Conditions Among CV Patients



“Our motivation for creating care pathways for HF patients was the realization that our hospital readmission rates were creeping up. We found ourselves with readmission rates higher than the national average and not going in the right direction.” - Director, Heart & Vascular Health

LHS Use Bundles to Promote Care Standardization

Participation in BPCI Advanced by Health System Size



Care Pathways, Like Bundles, are Operationalized at the Facility Level Before System-wide Rollout

The creation of standardized care pathways is closely aligned with the participation of LHS in bundled payment arrangements. The predominant bundled payment arrangement created by the Center for Medicare and Medicaid Innovation (CMMI) is the Bundled Payments for Care Improvement Advanced (BPCI Advanced) program. This program is voluntary, and participation occurs at the facility level rather than across the entire health system. Therefore, LHS are strategic about which facilities participate in the program and for which specific episodes of care.

BPCI Advanced Participation is a Function of Size

As shown at the left, participation in BPCI Advanced is largely a function of health system size, as larger health systems have a greater number of facilities available to participate. Four-fifths of participating large health systems (TOR > \$5 billion) have at least one facility participating in BPCI Advanced for at least one episode of care. However, within the sample, no small health systems (TOR < \$3 billion) have chosen to participate in BPCI Advanced to date.

Bundle participation has a notable influence on the implementation of standardized care pathways. When a health system participating in a bundle creates a care pathway, the system is likely to first implement it in the facility or facilities participating in the bundle. From there, the system works on deploying the care pathway to more facilities and eventually makes it the network standard for CV patient care.

“Bundles teach us how to work as a team.” - System VP, Heart & Vascular Service Line

Most Engage in Bundles for Multiple Clinical Episodes

Size Corresponds to Number of Clinical Episodes

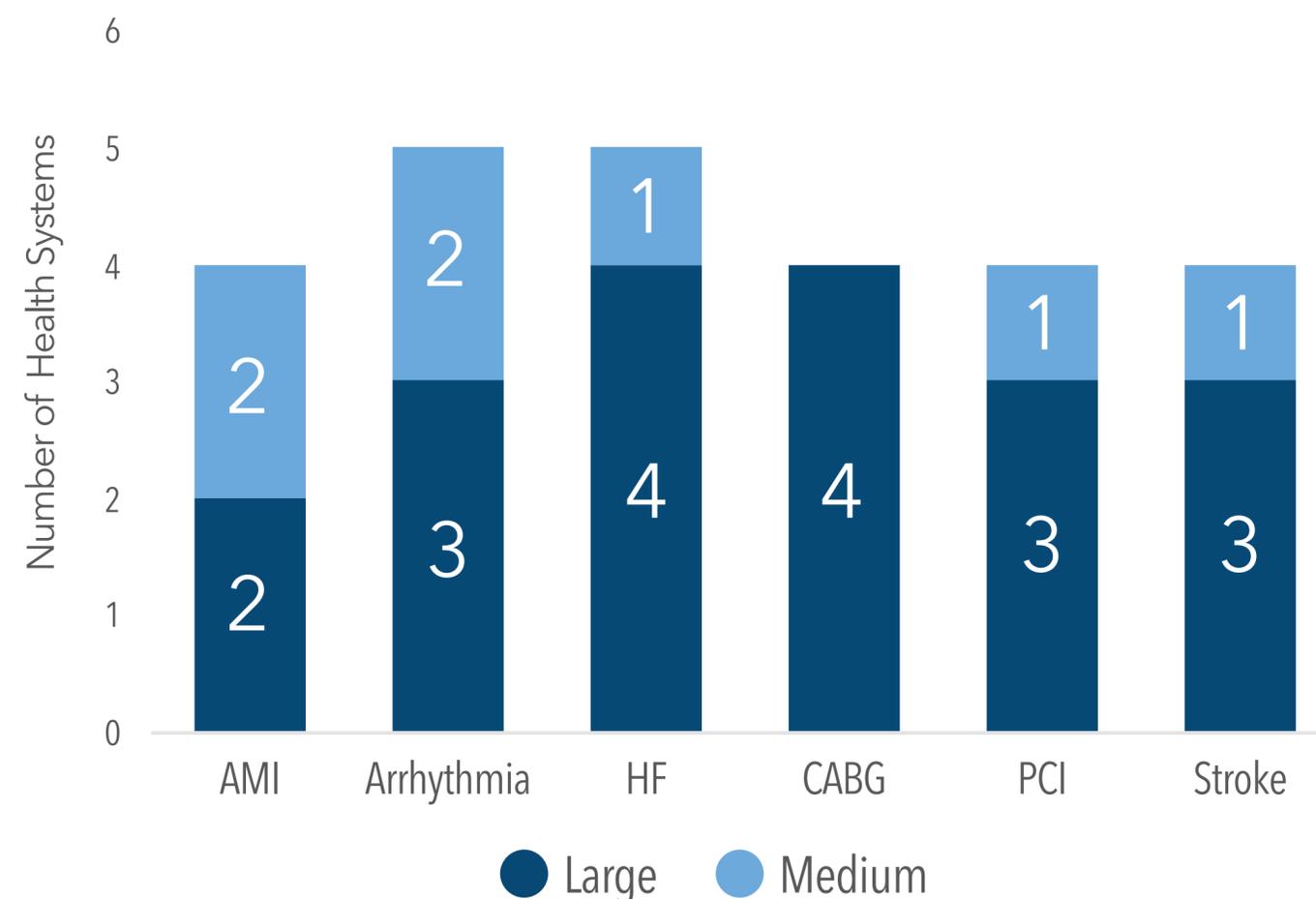
Health system size also affects the number of clinical episodes in which the health system participates. On average, large health systems (TOR >\$5 billion) participate in four CV clinical episodes, while medium health systems (TOR \$3-5 billion) participate in three. The most common clinical episodes among these health systems are AMI, cardiac arrhythmia, HF, coronary artery bypass graft (CABG), percutaneous coronary intervention (PCI), and stroke.

Participating LHS Find Synergies Among Clinical Episodes of Care

Since most health systems participating in BPCI Advanced choose to participate in multiple clinical episodes, these episodes often dictate the disease states for which the health system is most focused on standardizing. There also seems to be a synergistic effect of participating in multiple clinical episodes. One such health system has created what it calls the “readmission reduction protocol”, which is applied for patients within all of its bundles.

Overall, bundle participation allows health systems to practice their muscle memory within a value-based orientation. With the possibility of bundles becoming mandatory in the near future combined with the gradual shift toward value-based contracting, many health systems may find the need to build an infrastructure that allows them to better control costs and manage the care of complex patients.

Participation in BPCI Advanced by Clinical Episode



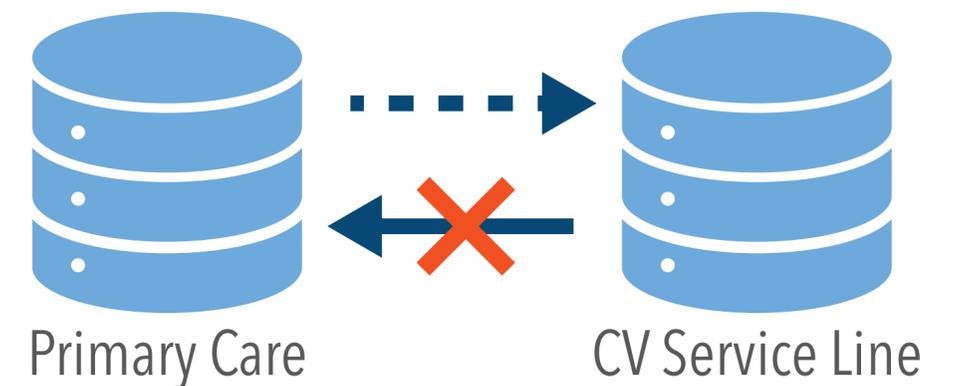
“We know that CMS will probably go to mandatory bundles, likely around 2022-2023. So our efforts seek to create initiatives by clinical episode to better align with payers as they switch to value.”
- VP, Strategy

Population Health Initiatives Begin in Primary Care

In addition to bundle participation, population health initiatives are becoming a higher priority for health systems as they take on more financial risk and increase their participation in value-based care (VBC). In general, initiatives that seek to address the social determinants of health are beginning in the primary care setting with strong influences coming from Accountable Care Organizations (ACOs) and other VBC arrangements. At present, such initiatives seldom have a root in the CV service line.

However, there is agreement among CV service line leaders that population health initiatives are important and will increasingly become a prominent part of the service line strategy. While these initiatives are broad and non-specific at present, they will become more condition-specific in nature as they are scaled from primary to specialty care.

Scaling Population Health Strategy



“The application of social determinants is going to be driven by the CV service lines, not pediatricians and primary care.” - Chief, Heart Care Medical Group

“I think truly drilling down to population health and prevention is going to be absolutely key for our service line in the future.” - VP, Corporate Service Lines

“The integration of population health into our service line strategy is part of our five-year plan to attain by 2023. Between now and then, we are trying to figure out the population health metrics and support necessary for patients with certain conditions. As you begin to have clinical service lines where you are at risk not only for value-based bundles, but you become more risk-oriented as a system, you can focus these population health measures to be disease-specific.” - VP, Strategy

Risk Provides Impetus for Primary Care Collaboration

As reimbursement from Medicare becomes a larger part of health system revenue, some LHS have been taking on more financial risk on the Medicare population with the goal of achieving savings through programs like ACOs and Medicare Advantage (MA). In addition to providing a platform to roll out population health initiatives, ACOs have been instrumental in alerting health systems to high costs associated with patients being treated for certain conditions. These arrangements may also provide opportunities for greater alignment and collaboration between the CV service line and primary care.

To this end, Health System A has started a joint venture with ChenMed, a primary care practice model that has proven to be profitable within the MA space. In servicing almost exclusively MA patients, ChenMed operates a “full-risk” model that provides high-touch care for elderly patients.

“Their outcomes are quite good. All of their metrics are reported per-member per-month on the scorecards. These are things we have never ventured into within traditional cardiology.”

In collaboration with ChenMed, Health System A is opening three geriatric-based primary care practices in underserved areas of its community. A cardiologist will serve all three of those clinics and at least one cardiologist will be on call 24 hours a day, 365 days a year, with the goal of preventing unnecessary hospitalizations among this population. The cardiologist will interface with hospitalists, other specialists, and the PCPs about individual patients’ care plans. Ultimately, Health System A hopes to save money while also providing higher quality CV care to its geriatric patients.

About Health System A

Region: Central

Size: Medium (\$3-5B TOR)

Hospitals: 11

Inpatient Admissions: 104K

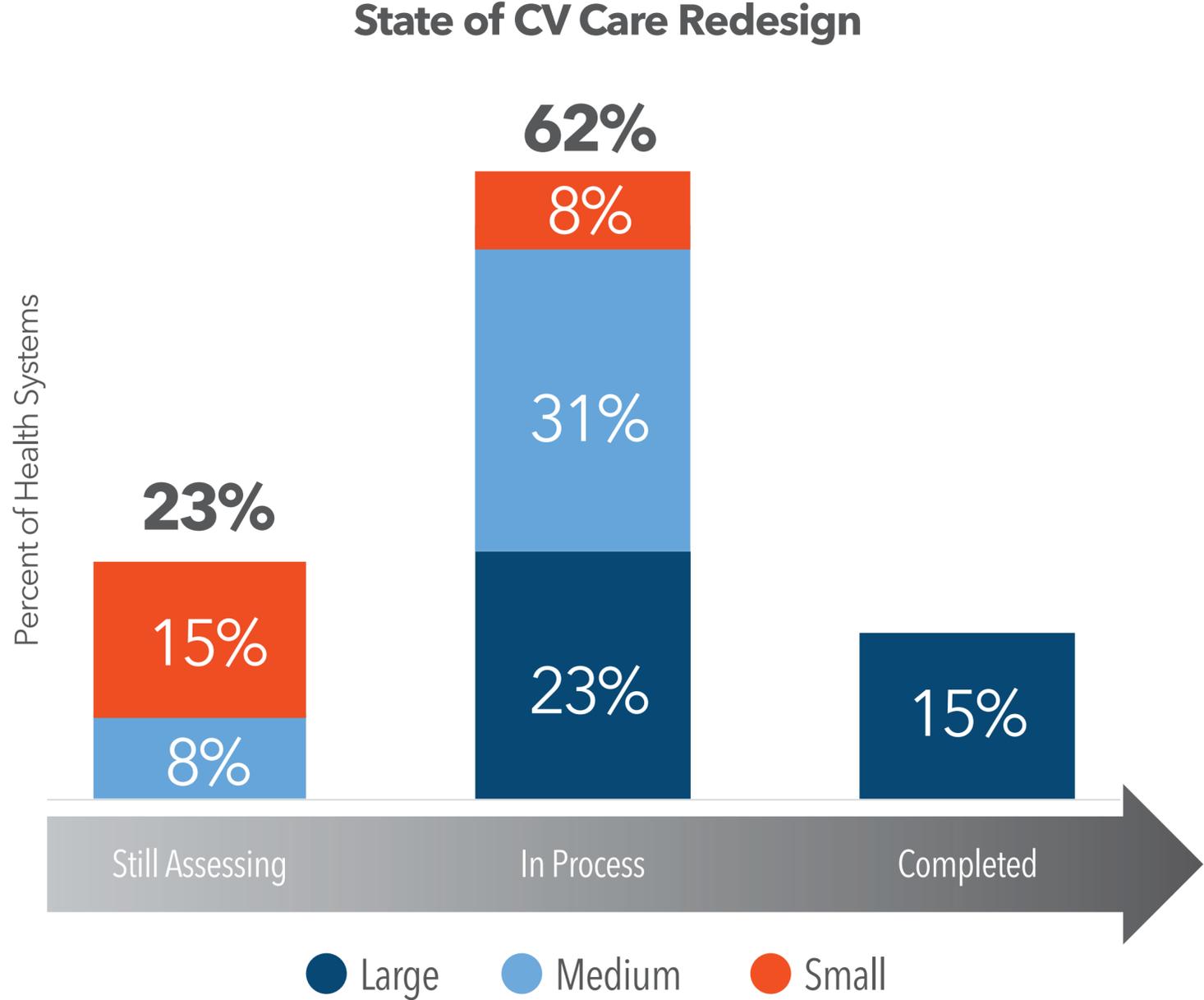
Outpatient Visits: 2.3M

Respondent Title: System VP, Heart & Vascular Service Line



CRI: Primary Care

Size Predictive of CV Redesign Progress



Most LHS are Making Progress on CV Care Redesign

Presently, a majority of LHS (85%) are still assessing or in the process of implementing a system-wide CV care redesign. Health systems are at different levels of maturity in terms of the implementation of care redesign initiatives. Generally, the progress these health systems have made is consistent with their size, as health systems with greater total operating revenue report being further along in the process of CV care redesign than those with lesser revenue.

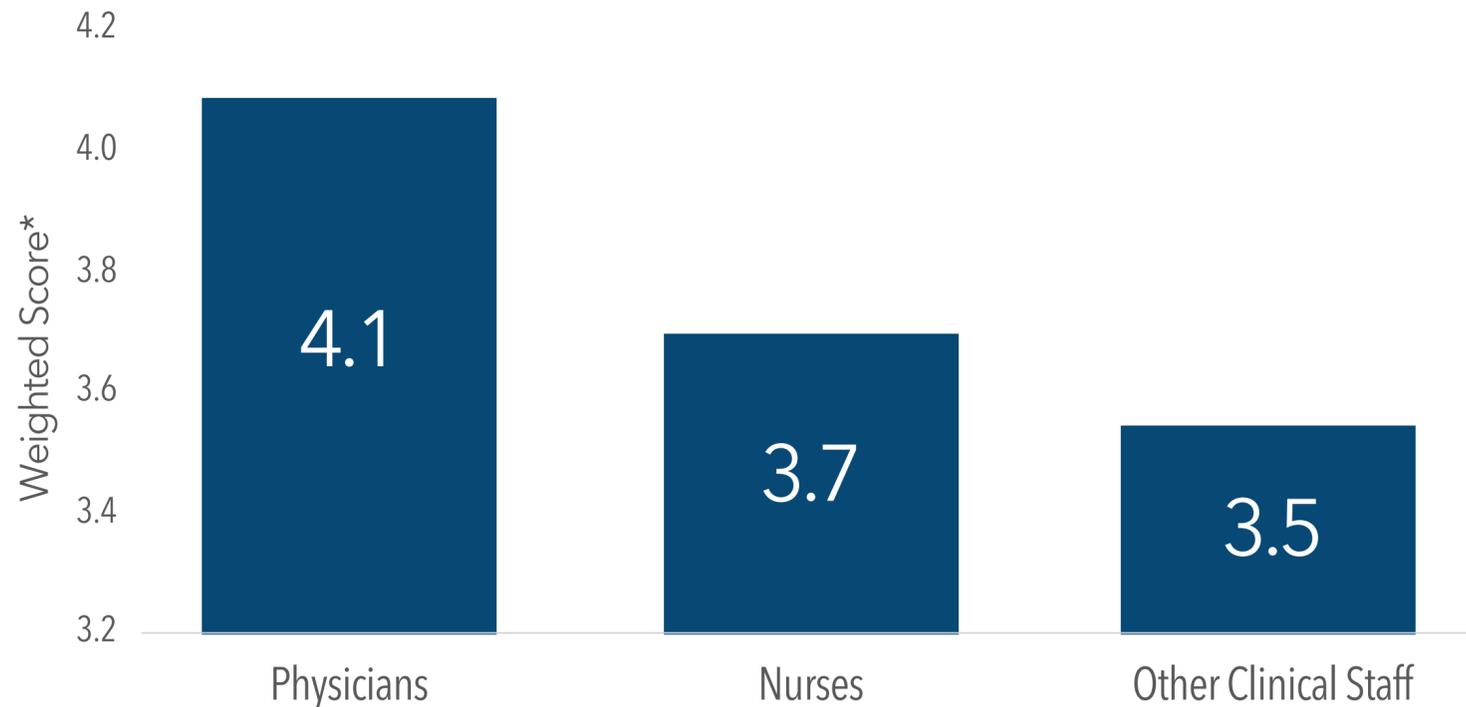
Committees and Peak Teams Necessary for Care Standardization Process

The process for rolling out care redesign initiatives stems from CV service line leaders and steering committees established to convene clinician leaders from different facilities across the health system. In deciding which initiatives to implement, service line leaders and committees often implement subcommittees and “peak teams” led by physicians and nurses that are tasked with coming up with action plans and standardized care pathways for CRIs.

Physician Involvement Essential for Buy-In

CV service line leaders report that engagement of physician leaders in the creation and adoption of care pathways is crucial for physician buy-in and adherence to the designed protocols. In seeking to quantify the strength of the educational programs necessary to roll out care pathways across the service line, health system executives provided a perceived measurement of the strength of educational programs by role. The fact that physicians are often involved earlier than nurses in the creation and implementation of care pathways likely explains the differential in the perceived strength of educational programs between physicians (4.1) and nurses (3.7). It is also for this reason that other clinical staff, who are not as often involved in the creation of care pathways, received a score of 3.5.

Perceived Strength of CV Educational Programs



“In the Afib sub-specialization movement, we try to get electrophysiologists on board first. We get their input up front on protocols and planning educational sessions, so they don’t feel that they’re getting this handed down to them from on high. Once that is complete, we get nursing leaders involved. Then, we go to the floors where we have nursing staff to help implement these pathways.”
- Chief Medical Director, CV Service Line

**Note: Weighted Scores are based on a Likert-type scale, assessing the perceived strength of educational programs for each role.*

Compensation Models Seek to Align Physicians

LHS Consider Financial Incentives for Compliance with Care Pathways

The topic of compensation structures is a high priority for nearly all participating CV service line leaders, as health systems are increasingly redesigning physician compensation models as a means to improve physician alignment. As health systems continue to make adjustments to compensation in an attempt to find the optimal model, they are starting to consider including compliance with standardized care pathways as a criterion for compensation. Service line leaders want to know how often physicians comply with the recommended care pathway, and they have begun pulling these data from their electronic health record (EHR). In many cases, physicians are required to consult with a colleague or include a written justification if they choose to deviate from the evidence-based protocol. One service line executive remarked that standardized order sets are used only 37% of the time, on average, but that they were able to increase the use of order sets by making that statistic visible to individual clinicians within the EHR.

Physicians Skeptical of Adjustments to Compensation

In this way, leaders hope to motivate individual physicians by tying their compensation to compliance with evidence-based care pathways. However, at present, most health systems are relying upon repetition, ongoing education, and a collegial commitment to care improvement to drive changes in clinician behavior. Unsurprisingly, there is substantial resistance by physicians to have their compensation tied to compliance with standardized care pathways as often as possible. In addition to the desire to practice medicine and manage patients in the way they deem to be medically appropriate, another significant obstacle is the fact that many physicians don't trust the accuracy of the data that would be used to determine compliance with particular care pathways. To use heart failure as an example, many patients are coded with a diagnosis of heart failure after being discharged, and data from one health system indicates that nearly one-third of these patients are coded inaccurately by medical coders. Therefore, physicians are skeptical of these data and do not want to allow faulty data to impact their compensation.

“We have what we call a balanced scorecard, which includes some individual and some group metrics. As we start to individualize the scorecards, some will include compliance for the physician to send everyone with a certain diagnosis out with specific medications. We haven't done that yet but we're headed in that direction.” - System VP, Heart & Vascular Service Line

Most Collect Quality Data at the Clinician Level...

“The top-level metrics we’re tracking are those that impact revenue. CMS payment penalties and rewards are at the top of that list.” - Director, Heart & Vascular Health

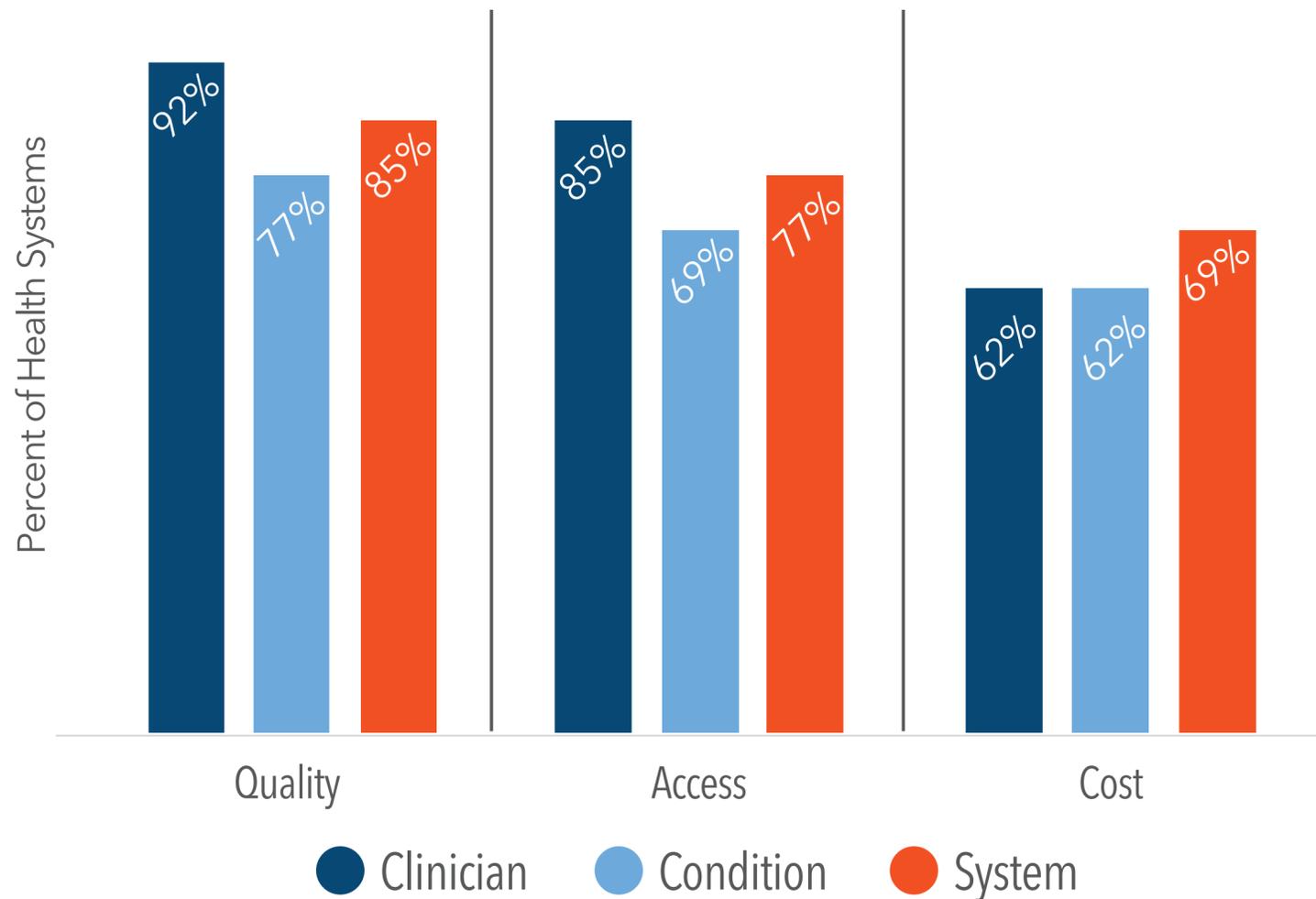
Readmission, Mortality, and Length of Stay are Most Common Metrics Measured

Most health systems report measuring quality, access, and cost metrics relevant to the CV service line at a variety of different levels of granularity. Clinician-level data collection is the most common across the board, while condition-specific metrics are the least common. Moreover, quality metrics are more widely measured than access and cost metrics. The most common quality metrics measured are the rate of readmission, mortality, and length of stay. This is because LHS tend to focus predominantly on measures that are publicly reported and those that directly affect reimbursement.

The creation of non-standard, internal measures and benchmarks is determined by participation in bundles and/or areas in which the health system has implemented standardized care pathways. For example, one health system that has created standardized care pathways for their Afib population has begun collecting data on several non-standard measures:

- Emergency Department immediate cardioversions;
- Management with oral anticoagulation therapy and education;
- Completion of a lifestyle assessment;
- Assignment to rhythm control.

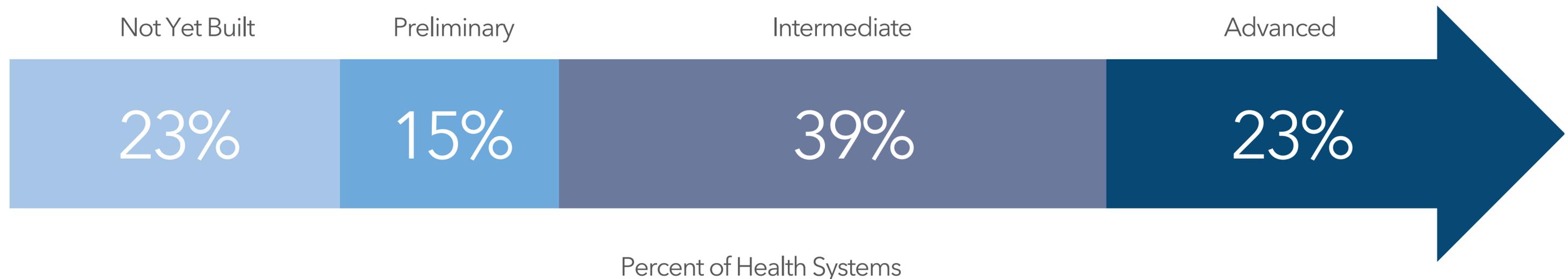
Level of Granularity for Success Measures



...But Few LHS Have Operationalized These Data

To reap the full benefits associated with clinical data collection and analysis, most LHS have begun building or recently completed building a data dashboard. In an ideal state, these dashboards can pull data directly from the EHR and be used to visualize various pieces of performance and outcome data at different levels of granularity. In fact, a majority of health systems (62%) describe their data analytics infrastructure as “intermediate” or “advanced”, but very few of them are feeding this data back to clinicians and using clinical data at the point of care as a tool for clinician decision support. While data dashboards are useful for service line leaders and health system strategy more broadly, these data are generally not being operationalized in any meaningful way to influence care delivery. For many health systems, the effort required to implement standardized care pathways and achieve physician compliance has taken attention away from assessing how to best utilize a data dashboard.

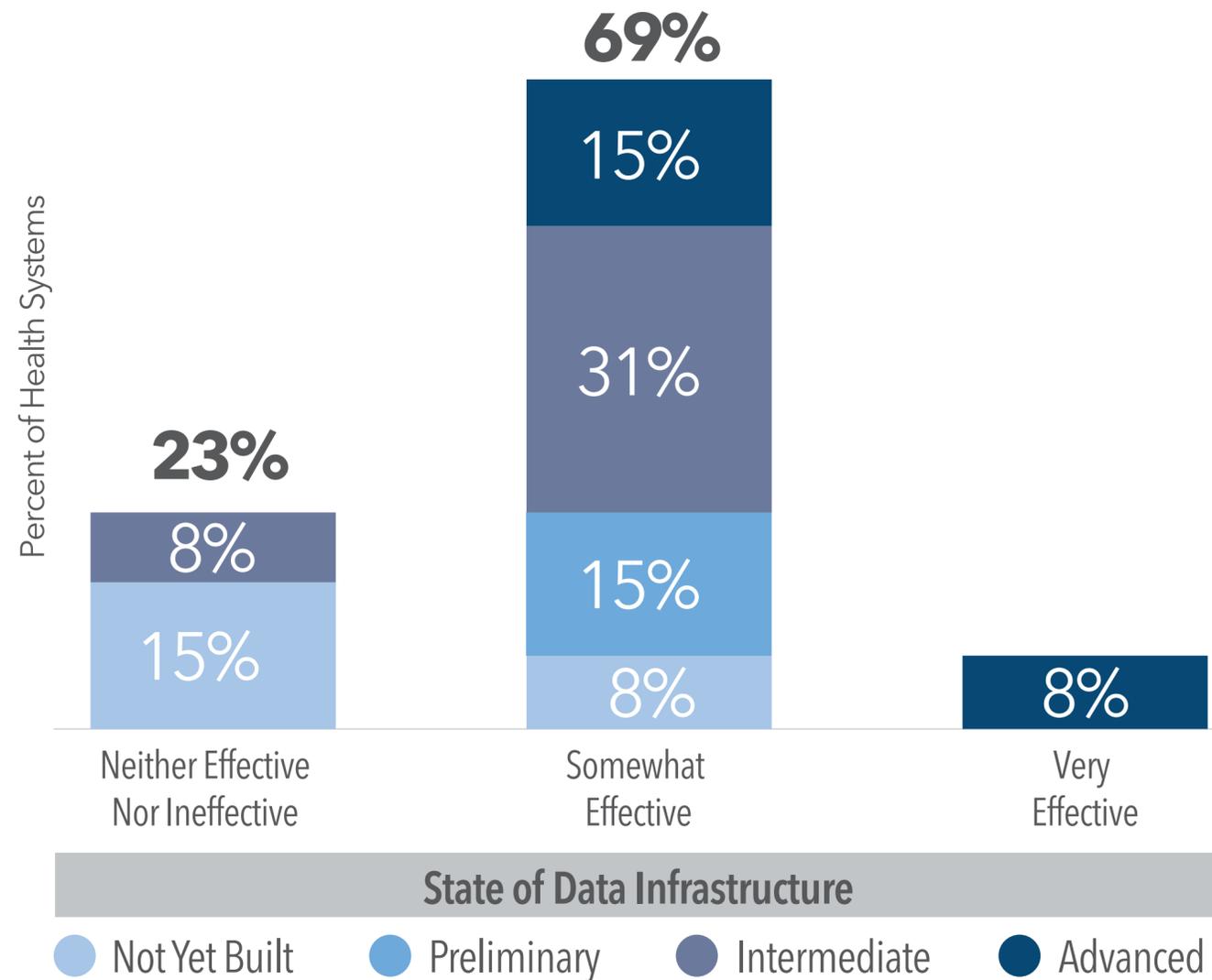
State of Data Analytics Infrastructure



“We have rudimentary data dashboards, but the data comes mainly from registries. So it’s more quality data than clinical decision support data, and clearly we need more real-time data since registries lag so much. I think like many health systems, we are slow and a little late to the party.” - Chief Medical Director, CV Service Line

LHS are Beginning to Use Data and Predictive Analytics for Diagnosis and Treatment

Perceived Effectiveness of Early Identification and Diagnosis by State of Data Infrastructure



Advanced Data Infrastructure Enables More Effective Early Identification and Diagnosis

While many health systems are focused on creating data dashboards, fewer of them are using data to predict outcomes and risk-stratify patients. For the health systems that are dabbling in predictive analytics, this effort is focused on the acute care setting to identify the acuity of patients that arrive in the ED. Most health systems (69%) indicate they are only “somewhat effective” at the early identification and diagnosis of patients with CV conditions. Furthermore, the state of the health system’s data infrastructure is directly related to the perceived effectiveness of early identification of CV conditions. Future initiatives will likely extend this predictive model to the primary care setting in combination with social determinants data as a means to prevent disease before it occurs and detect signs of disease earlier.

“We’ve done some work around HF but at the time of admission. We have a predictive analytic tool that shows the risk of mortality and other serious outcomes at admission. So we have done a little bit but not anything to support point-of-care decision-making.” - VP, Heart Institute

Risk Stratification Allows Targeting of Resources

As health systems continue to gain maturity in their data analytics infrastructure, they can better predict patient outcomes and strategically allocate resources to high-risk patients discharged from the hospital setting. Health System B realized that its 30-day readmission rates are strongly influenced by HF patients. They found that patients with severe cases of disease that weren't ready for hospice were the ones that kept being readmitted to the hospital. Using an analytic software tool from Health Catalyst, Health System B was able to create an algorithm to risk-stratify HF patients most likely to have a readmission. The software aggregates information from multiple sources and then ranks all of the HF patients currently in the hospital in order of their risk for readmission.

“We thought if we could identify that strata accurately, we could really ramp up extensive care on an outpatient basis to help keep them out of the hospital.”

As part of a trial, Health System B takes the top six highest risk HF patients and provides them with additional resources both while they are in the hospital and for 30 days after discharge. These patients are set up with weekly outpatient visits to a “bridge clinic”, which is focused on the needs of high-acuity HF patients. This cohort is also in frequent contact with providers throughout home care. The combination of predictive analytics and 30 days of intensive outpatient care for this high-risk cohort has led to a significant drop in readmission rates for the health system.

About Health System B

Region: Eastern

Size: Small (<\$3B TOR)

Hospitals: 1

Inpatient Admissions: 53K

Outpatient Visits: 602K

Respondent Title: Director, Heart & Vascular Health



CRI: Home Care

Challenges & Approaches Across Care Settings

Variation, Engagement, and Cost are Top Challenges



Top Challenges for CV Care Delivery

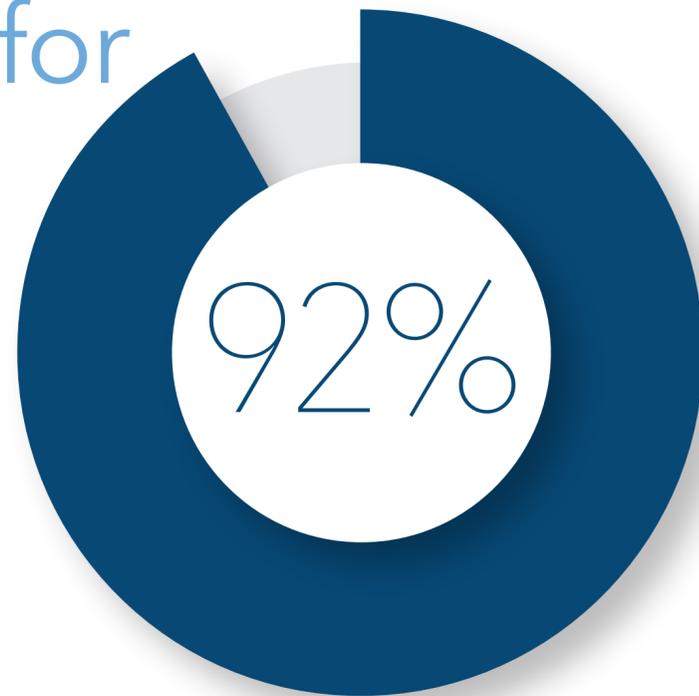
Challenges	Weighted Score
Reducing Clinical Variation	37
Patient Engagement	30
Managing the Total Cost of Care	24
Continuity of Care Between Primary and Specialty Care Settings	23
Insufficient EHR Capabilities	23
Overreliance on Outcome Measures, Lack of Process Measures	21
Lack of Actionable Data	16
Undertreatment of Cardiovascular Conditions	13
Underdiagnosis of Cardiovascular Conditions	4
Lack of Prioritization Among Health System Leadership	3
Misdiagnosis of Cardiovascular Conditions	2

As CV service line leaders continue along in the care redesign process, it is necessary to understand the primary obstacles they face. Reducing clinical variation, increasing patient engagement, and managing the total cost of care are the challenges most commonly identified by CV service line leaders. As their health systems continue to increase in size through mergers, acquisitions, and organic growth, these leaders are acutely aware of the need to reduce excess costs at scale. Notably, many of these challenges are most prominent in the inpatient setting. In rethinking a system-wide care redesign, health systems are starting to consider how to approach these challenges in the ambulatory setting as well.

“One area we’re starting to focus on is how to reduce the total cost of care. We are a service line that has historically had a positive contribution margin, but there is an ominous look to where this might go. A lot of effort has been focused on reducing costs and eliminating duplication. That is really hard work with far-reaching implications.”
- Medical Director, Heart Institute

Reducing Clinical Variation is the Top Challenge

REDUCING CLINICAL
VARIATION IS A
HIGH PRIORITY
for



OF PARTICIPATING
HEALTH SYSTEM
EXECUTIVES

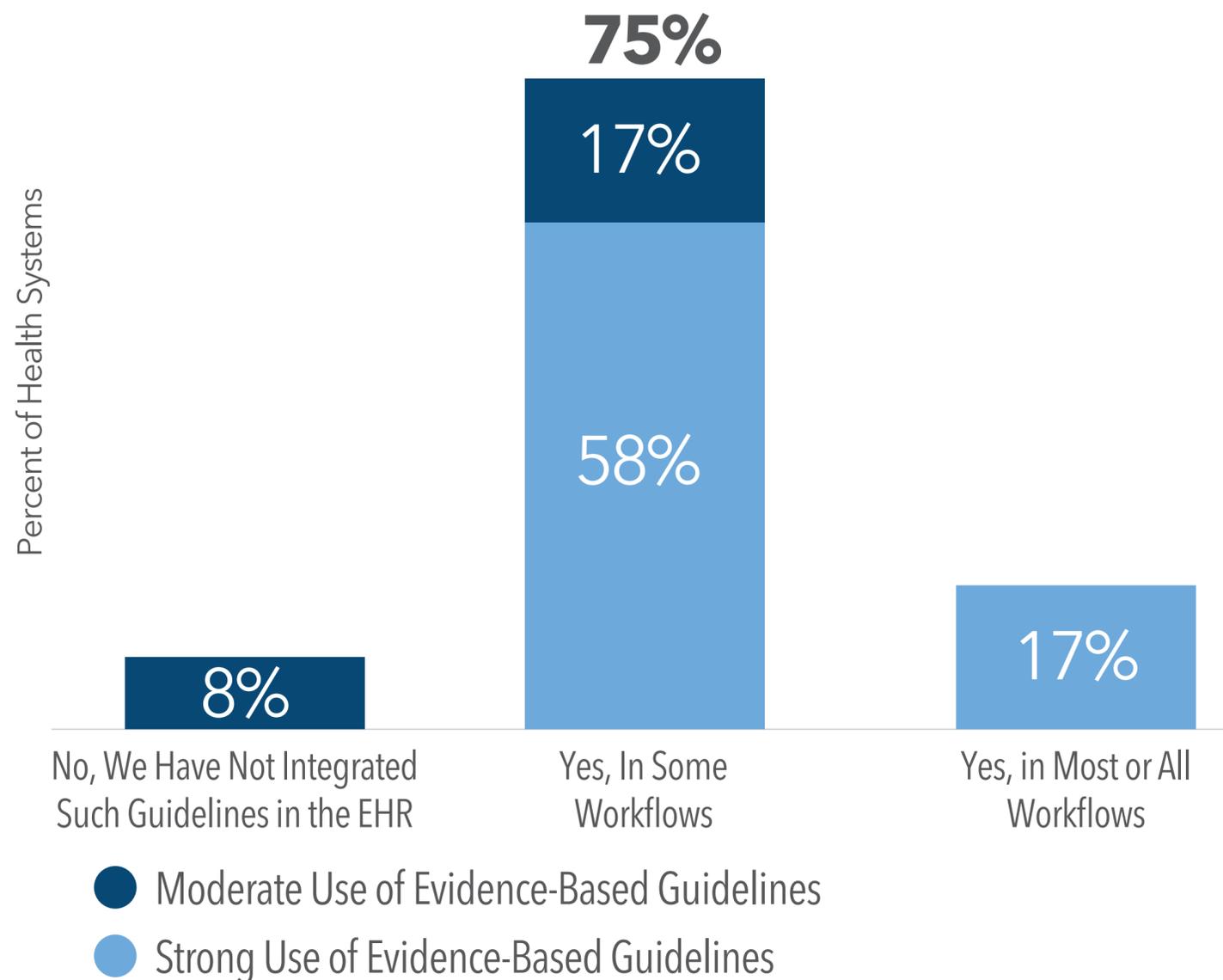
“Clinical variation is an ongoing challenge. We have three programs operating within 50 miles of each other. Both between the programs and within the programs, you have the same population of patients, but there are vast differences in the cost of care. So if we can reduce the amount of clinical variation across the board, we’re going to improve quality and drastically reduce costs. Our biggest challenge is doing that at scale.” - VP, Heart Institute

Across the board, all health systems understand the importance of care standardization as a means to manage cost and improve outcomes. While most health systems (92%) place a high priority on reducing clinical variation, they also find care standardization to be the most challenging obstacle they face in the process of care redesign. To this end, health systems focus on creating system-wide care pathways, typically for a single condition at a time, and they roll these pathways out in a methodical and deliberate fashion. In having physicians utilize evidence-based, board-endorsed guidelines to decide what should be done sequentially for patients from the time of admission through discharge and even in post-acute settings, service lines have begun trying to reduce clinical variation.

However, these care standardization initiatives have been met with limited success for a variety of factors: compensation structures that don’t reward compliance, differences in physician employment arrangements, and a lack of real-time data to guide decision-making. In spite of this complex challenge, setting concrete and achievable goals has proven helpful for care improvement initiatives. According to one service line leader, it is essential to revisit these initiatives at least every six months to remind and reeducate staff and keep success metrics top of mind.

Most Have Integrated Some Pathways into EHR

Integration of Care Pathways into the EHR



EHR Integration of Guidelines May Result in Stronger Utilization

As part of their care redesign strategies, a majority of LHS (92%) have begun work to integrate evidence-based guidelines and care pathways into their EHR in the form of standardized order sets, automated workflows, and customized flags and checklists. Standardized order sets help to spell out what should happen clinically each day following an admission for a particular condition. Even so, the process of building these workflows and customizations is not an easy one, and many executives report frustration throughout the process of building and enforcing such pathways. Moreover, health systems that have integrated a greater number of guidelines into the EHR report stronger consistency in the utilization of such guidelines. Nonetheless, the work required to create and integrate additional care pathways is an ongoing process for a majority of health systems, and insufficient EHR capabilities and customizability pose considerable roadblocks to this process.

“We have built a discharge checklist that I think of as a ‘nudge’ modality within Epic, which is essentially custom code. It pops up, and it’s a gentle reminder, not a hard stop, to do the right thing overall. The challenge is getting people to do the right thing and deliver evidence-based care.”
- Medical Director, Heart Institute

CVIS May Help Overcome Insufficient EHR Capabilities

To overcome insufficient EHR capabilities, many health systems have begun implementing Cardiovascular Information Systems (CVIS) integrated directly into their EHR. These platforms allow clinicians to more easily document and track patient records, view imaging studies, and run reports and data analysis specific to CV patient care. New CVIS solutions have integrated previously siloed IT functionalities and now allow a single point of entry for a variety of different CV subspecialties. However, there is no agreement on which CVIS is ideal, and in some cases, the decision of which CVIS to implement is limited by integration requirements with the EHR. CV service line leaders do agree, though, that none of these solutions work well for invasive procedures, like catheterization or electrophysiology (EP), because they are inherently more complicated and subject to greater variation. Vendors commonly utilized and evaluated by participating health systems are Epic Cupid, Fujifilm Synapse Cardiovascular, LUMEDX Apollo, and IBM Merge and Ascend.

“Nine out of 10 of our non-invasive docs wanted to use Fuji because it has a better reporting system than Cupid. For vascular reporting, we feel that Fuji is a much better option as well. Fuji and Cupid both work well in the non-invasive space, and they are equally problematic in the interventional space. **But our interventionalists are adamant about using Cupid. Ultimately, we might need to go with both.”**

- System VP, Heart & Vascular Service Line

“We’re chasing after a couple of the Cerner build-ons. There’s a product called Ascend and another called Merge that are integrated data management tools. Merge, which is the image management software, and Ascend, which is for report viewing, are integrated seamlessly in Cerner.”

- Director, Heart & Vascular Health

“Fuji has been helpful for the collection of data into one portal, and the echo and nuclear parts have been well-received. But no platform seems to have a good solution for the interventional stuff. **When you look at cath, EP, and peripheral vascular intervention, those are the most complicated and have so much variation.** The non-invasive stuff is easier for an algorithm.”

- Chief Medical Director, CV Service Line

Patient Education Strong, but Engagement Lacking

Patient Engagement a Challenge Despite Strong Education

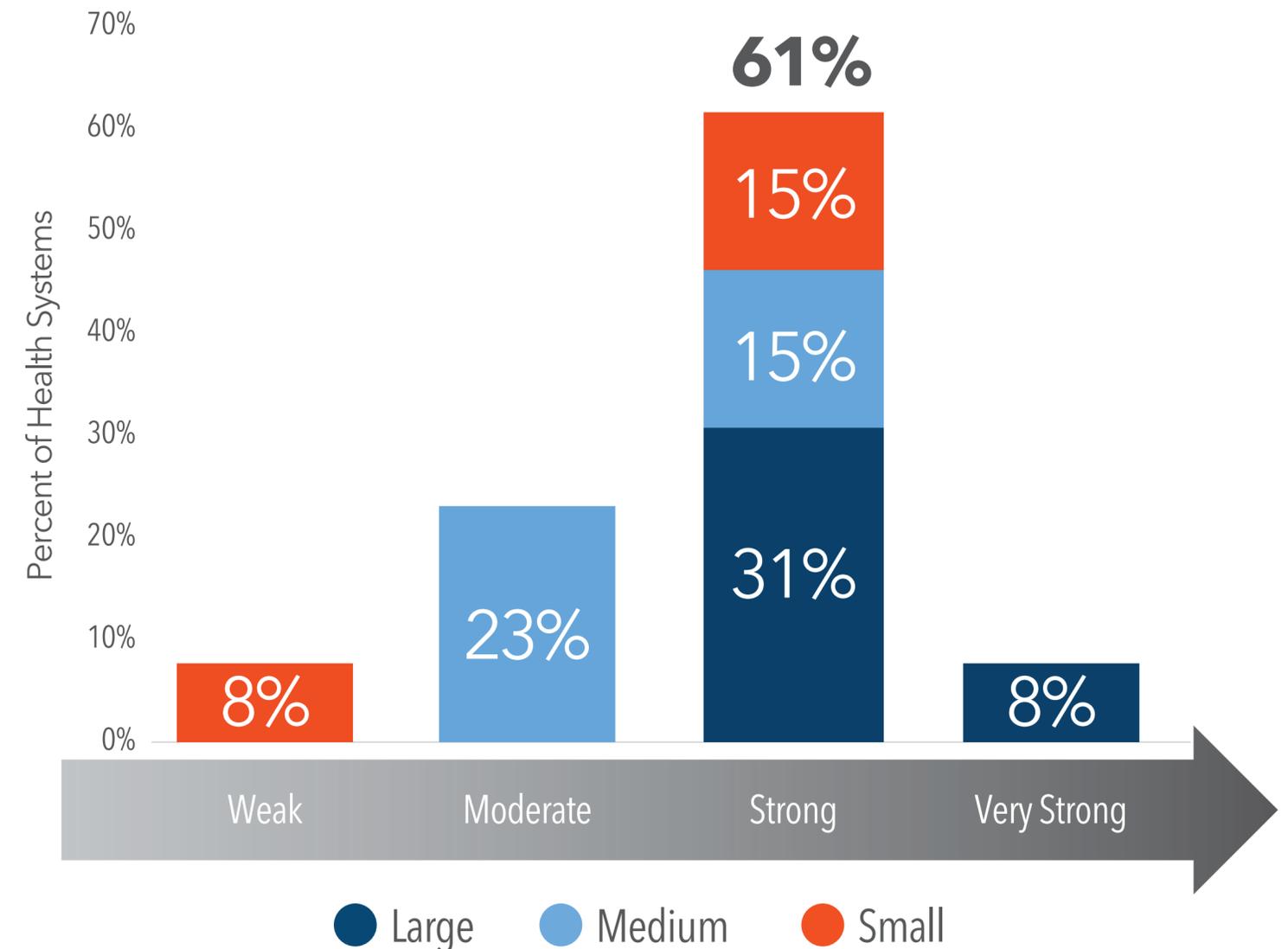
Overall, health systems feel that their patient education programs are robust, with 69% reporting that the education they provide for CV patients around risks and treatments of CV conditions is “strong” or “very strong”. In general, larger health systems are more likely to report having strong educational programs for CV patients compared to medium and small health systems. Most of these health systems rely on the use of nurse educators at the bedside and phone-based follow-up with care managers to provide education to patients. Some have also begun leveraging patient-facing apps and other digital platforms to supplement in-person education and provide a medium for engagement after leaving the acute care setting.

Shared Decision-Making is Important but Not Sufficient

Most health systems feel that shared decision-making is necessary to help ensure patient understanding and engagement in their care. However, health systems have yet to quantify the impact of this education on their patients. Moreover, shared decision-making alone has not been sufficient to ensure long-term engagement with care plans, which is why this topic continues to be a substantial challenge for health systems.

“Shared decision-making is core to our program. The patients are vital to the creation of their care program. We don’t measure the impact of that though.” -Service Line Executive

Perceived Strength of Educational Programs for CV Patients



Patient Apps Create Opportunities for Engagement

As health systems seek to enhance patient engagement and allow patients to receive a sufficient level of care from their own homes, they increasingly turn to technology. Telehealth platforms, remote monitoring devices, and patient-facing smartphone applications are becoming a larger part of patient care to supplement home care and outpatient care.

Health System C has decided to build a patient-facing app designed specifically for their Afib patients. Still under development with a technology partner, this app will provide educational tools to patients and allow for the collection of information pertinent to their care.

“We’ll collect biometric information from the patient. They themselves will put in their blood pressure and weight for the day and rank how they feel.”

On the back end, data analysts will collect the data, measure patient interactions with the app, and see if they can tie any positive health impact to the utilization of the app. If successful among the Afib population, Health System C will likely modify the app and deploy it to other patient cohorts as well.

About Health System C

Region: Eastern

Size: Small (<\$3B TOR)

Hospitals: 2

Inpatient Admissions: 60K

Outpatient Visits: 2.1M

Respondent Title: Executive Director, Heart and Vascular Services



CRI: Virtual Care

HF Clinics Provide a New Option for Post-Acute Care

Despite increasing continuity with primary care, PCPs are often unable to see CV patients quickly enough after discharge from the hospital, and in many cases these patients are too sick to seek routine care from a PCP. For this reason, CV service line leaders have directed more energy to integrating post-acute settings into their care pathways and overall care redesign strategy. Several health systems have found success in managing cost by working to reduce the length of stay of patients in skilled nursing facilities (SNFs) following hospital discharge.

Health System D has created a network of HF clinics run by nurse practitioners (NPs) within most of its acute care hospitals. These clinics are easy-access locations where patients can come in for follow-up care following discharge. An inpatient navigator is able to sit with the patient and schedule the follow-up appointment with a NP before the patient even leaves the hospital. Care managers also make sure the patient will have transportation to come in for their follow-up appointment, and they provide the patient with a 30-day supply of medication before leaving the hospital. Because these clinics are generally in the same hospital where the patient received care, the setting is already familiar and accessible to the patient.

Health System D is also using a software program called Clarifire that integrates with Cerner to identify patients that appear to meet clinical criteria for discharge. The health system has seen a lot of success with the use of this program combined with the creation of NP-lead clinics.

“Among patients that receive follow-up care in our HF clinics, they have a readmission rate of only 5-6%.”

About Health System D

Region: Eastern

Size: Medium (\$3-5B TOR)

Hospitals: 10

Inpatient Admissions: 178K

Outpatient Visits: 1.5M

Respondent Title: Medical Director,
Cardiovascular Service Line



CRI: Post-Acute Care

Patient-Reported Outcomes Provide Crucial Data

Because so many CV conditions are chronic in nature, it is necessary to understand the patient's perception of their own health, quality of life, and functional status associated with their condition in everyday life. Health System E has begun a new initiative to collect patient-reported outcomes and integrate the patients' perception of value into the way they make decisions.

“When a patient is going into care, their concern is that it will be safe and effective. They worry about things like, ‘when is the incision on my chest going to stop hurting’ or ‘when can I play golf again’.”

This initiative was first implemented for total joint replacement patients, and then it was brought into CV and applied to patients that had undergone coronary artery bypass grafting and percutaneous coronary intervention. The structured survey based on the Seattle Anginal Class Survey was originally administered via a third-party application, but it has since been rebuilt using Epic, which offered the health system greater flexibility in administering the survey. The next phase of this initiative will likely incorporate patients that have undergone Afib ablation.

Health System E hopes these data will help them to understand the efficacy of care from the patient's perspective. The health system will also use the data to justify using less costly and less risky procedures if the patients' perception of efficacy is the same or better. Finally, Health System E believes that it can use these data in negotiations with payers to validate the use of more cost-effective procedures by showing patient satisfaction with their outcomes.

About Health System E

Region: Western

Size: Large (>\$5B TOR)

Hospitals: 50

Inpatient Admissions: 510K

Outpatient Visits: 12.2M

Respondent Title: Vice President, The Heart Institute



CRI: Healthy Living

Informed Practices for Care Redesign

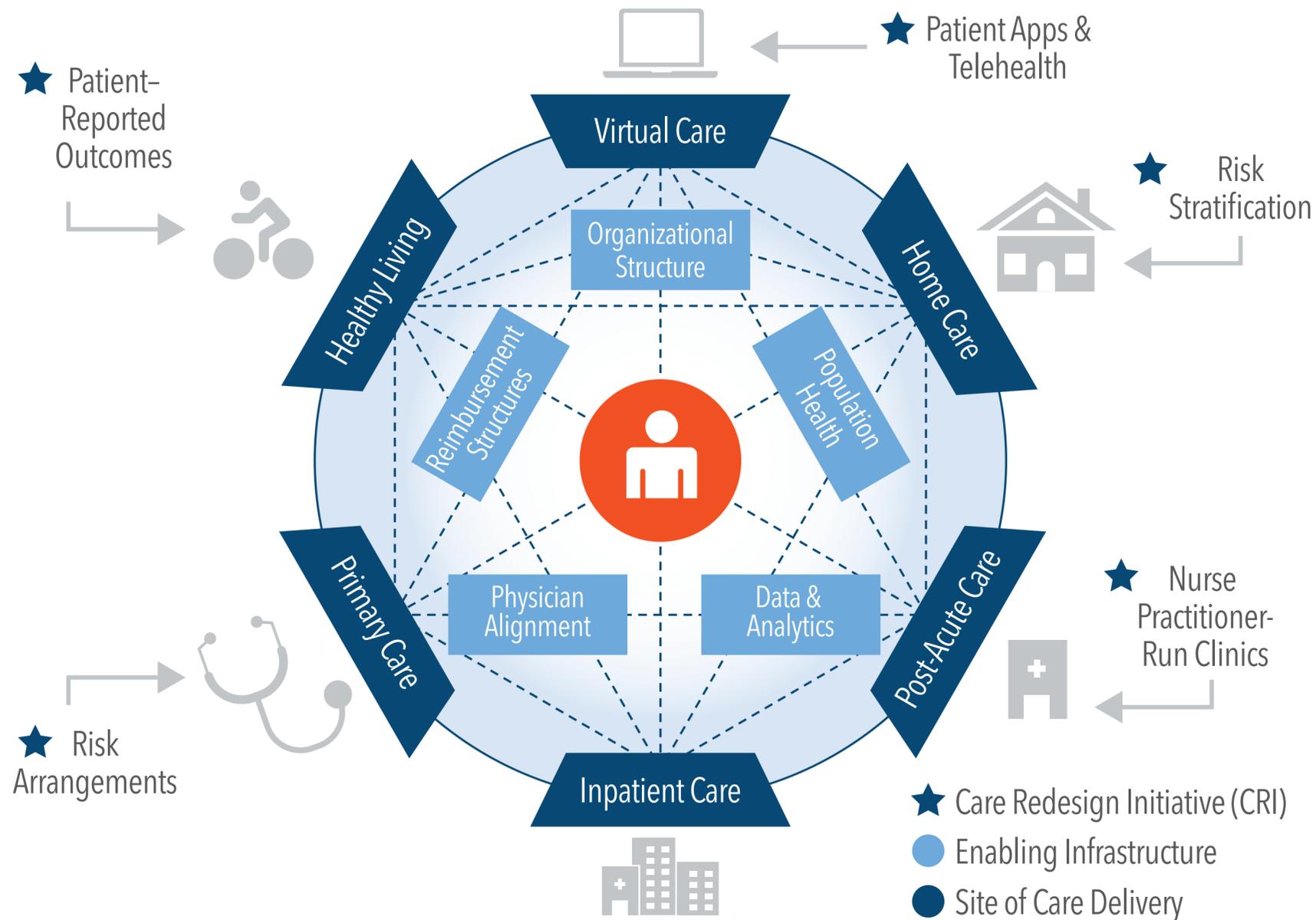
Care Redesign Initiatives in Practice

LHS Use Partnerships and Technology Solutions to Facilitate Care Redesign Initiatives

Health System	Issue	Condition/Procedure	Proposed Solution	Mechanism	Stage
A	Poor management of CV conditions among patients in primary care settings	All	Initiation of partnership with ChenMed and building new primary care clinics	Partnership	Early
B	High 30-day readmission rates among patients discharged to home care	HF	Use of an algorithm to identify most high-risk patients and target additional resources	Technology	Ongoing
C	Poor data collection and educational resources available for patients outside the clinic	Afib	Creation of a patient-facing mobile application	Partnership	Early
D	Patients unable to schedule follow-up with cardiologist quickly enough post discharge	HF	Creation of nurse practitioner-led clinics in acute care settings	Technology	Ongoing
E	Need to understand patient definition of wellness and connect to cost and efficacy	CABG & PCI	Administration of a structured survey to patients using Epic	Technology	Expanding

Informed Practices for CV Care Redesign

The Care Redesign Framework



While there are many approaches to CV care redesign, each health system has concentrated on only a handful of initiatives at a time, particularly those focused outside the acute care setting. Additionally, each health system is at a different stage in the implementation of these initiatives, depending on a variety of factors including the maturity of the CV service line, extent of organizational restructuring, and propensity for innovation in disparate work streams. To be successful in CV care redesign:

1. Consider investing in all elements of the enabling infrastructure for care redesign.
2. Broaden the focus of care redesign strategy beyond the CV service line setting to integrate digital platforms, primary care, and home care.
3. Leverage the Care Redesign Framework as a tool to assess the current progress of care redesign and provide a guideline for where future initiatives should be focused.

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Methodology

In March and April of 2019, The Health Management Academy conducted a quantitative survey of Leading Health System executives regarding their cardiovascular service line. This was followed by a series of qualitative interviews throughout the course of May and June 2019. The 23 total respondents represent 19 unique health systems. Respondent roles included Heart Institute VP, VP of Strategy, VP of Service Lines, VP of Medical Affairs, Regional Chief Medical Officer, Medical Director of the Cardiovascular Service Line, Executive Director of Heart and Vascular Services, and Chief of Heart Care Medical Group. The responding health systems have a median Total Operating Revenue of \$3.9 billion and own or operate a total of 339 hospitals.

Disclaimer: The information and opinions in this report were prepared by The Academy. The information herein is believed to be reliable and has been obtained from public and proprietary sources believed to be reliable. All survey data and responses are collected in good faith from sources with established expertise and are believed to be reliable. Opinions, estimates, and projections in this report constitute the current judgement of the authors as of the date of this report. They do not necessarily reflect the opinions of The Academy or Pfizer and are subject to change without notice. Any products referenced within this report have not been independently evaluated. Neither The Academy nor Pfizer recommends or endorses any of the products identified by survey respondents. All registered names or brands referenced in this document remain the property of their respective owners and are included for identification purposes only. This report is provided for informational purposes only. Any reproduction by any person for any purpose without The Academy's written consent is prohibited.

Participating Health Systems

AdvocateAuroraHealth



The Academy

The Health Management Academy (The Academy) brings together health system leaders and innovators to collectively address the industry's biggest challenges and opportunities. By assisting member executives to cultivate their peer networks, understand key trends, develop next-generation leaders, and partner to self-disrupt, they are better positioned to transform healthcare.



100 Health Systems

500+ C-suite Executives

2,000+ Health System Leaders

66%

Inpatient
Admissions

62%

Outpatient
Visits

67%

Total
Physicians

62%

Total Operating
Revenue

About Pfizer Inc.

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¹ <https://www.pfizer.com/about/leadership-and-structure/company-fact-sheet>