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Chapter 25

Disruptive Innovation: The Role of Hospitals, Integration, and the Value-Added Process

Jeffrey Low, MD, MBA, Richard Menger, MD, MPA, and Gregory Mundis, MD

► Key Points

- The current hospital reimbursement model is volume and asset driven, but this is not sustainable
- Alignment of current incentives makes hospital reform difficult and sluggish
- Value-added process (VAP) business models and integrated delivery provide sustainable innovation in hospital-centered health care delivery
- Integrated delivery models have and will disrupt the hospital system
- Emphasis on value and integration provides new challenges and opportunities for neurosurgeons

► Background

While primarily addressing issues of health care access, the Affordable Care Act (ACA) has brought to the forefront of American political discussion the debate on how to reduce costs and improve quality in the world's most expensive health care system. Policy initiatives such as accountable care organizations (ACOs) and bundled payments have often put hospitals at the center of changes designed to reorganize care delivery to address wasteful spending, which is estimated to represent over 30 percent of US health care spending.[1] Yet these early efforts to change the provider business model have seen mixed results on cost savings[2] and shown a trend toward increasing hospital consolidation leading to higher prices, which these efforts have incentivized.[3]

Hospitals will continue to play a key role in health care, but they will find it exceedingly difficult to rely on their current model to eliminate wasteful spending, because their business model is predicated on expanding and utilizing costly resources optimized for a distorting system of fee-for-service reimbursement. Increased scale through consolidation will only worsen pricing trends as systems gain additional market power. However, organizations whose business models generate profits through their business processes, like value-added process businesses and integrated delivery systems, will be better positioned to lower costs through increased efficiency and reduced waste. Though these organizations have been successful regionally, their need for scale in a geography has limited their ability to expand and dislodge existing players. As payment models shift increasingly to value, organizations will increasingly find it necessary to change their business model to one that

utilizes processes to increase coordination of care. Moreover, integrated delivery systems have an opportunity to become a key enabling value network for disruptive innovation, allowing them to capture some of the benefits of new technologies and business models that drive down the price of health care by moving delivery closer to patients.

Disruptive Innovation

Disruption, in the traditional sense, refers to the process by which a smaller company with fewer resources challenge incumbents by targeting overlooked portions of the market. That is, incumbents tend to provide and focus services for certain highly profitable or demanding clients. As a result, certain segments of the market are overserviced, and some are simply ignored. Disruptive entrants target these populations, gain footing in the industry, and are well positioned to move upmarket with a more advantageous production process. The true process of disruption comes when those originally mainstream customers adapt the new entrant's product.

A classic example is that of Netflix. Initially launched in 1997, the entrant targeted a more overlooked customer segment. That is, mainstream movie rental companies focused on in-person shopping and impulse rentals of latest hits. Netflix, with several days of mail delivery delay, targeted a more thoughtful movie connoisseur. Over time, and with the increase in technology, mainstream movie customers began to shift toward an online streaming process. The core customers had adopted the entrant's technology. In 2010, Blockbuster LLC filed for bankruptcy protection. Netflix had changed the distribution of media. This is well described in the 2015 *Harvard Business Review* article "What Is Disruptive Innovation?" by thought leader Clayton Christensen (available at https://hbr.org/2015/12/what-is-disruptive-innovation).

Can this process be applied to hospitals in the United States? Can disruptive innovation change health care delivery?

Historical Hospital Profit Model

New payment models assume that incentive payments will be sufficient to change hospital behavior in a way that significantly lowers health care spending. Incentive payments alone, however, will not be enough to drive down costs, because the hospital business model fundamentally revolves around amassing and utilizing costly resources.

The organizational model of the general hospital emerged at the beginning of the age of intuitive medicine, when the field began organizing the basis of modern medical knowledge. In this period of its history, medicine was little more than an assortment of observations about symptoms rather than causes, and consequently, even the best experts delivered unpredictable outcomes. Hospitals became workshops that often integrated scientific research, clinical training, and patient care. They offered a value proposition of helping people find a diagnosis for any medical problem and a recommended solution. Given the state of medical understanding, delivering this value proposition was highly reliant on having the most expert clinical staff possible. As time passed, more advanced laboratory and diagnostic equipment became available. Yet medical understanding was still more an art than a science, and the world's experts were still needed to interpret the results of these tests. To treat more and more patients, each of them with a poorly understood problem and personalized treatment plan, required adding more and more resources, a good general hospital requiring all the necessary people and equipment to address a disorder anywhere in the body. More doctors, more nurses, more equipment, and bigger facilities led to higher fixed costs.

The capability of a hospital then resided in its resources. Because each problem was unique, resources and equipment could not be

closely linked by repeatable processes. Each patient would have to take one of perhaps hundreds of paths throughout the hospital that needed to keep expensive doctors and equipment separated into departments to maintain the flexibility to do anything for anyone.

Eventually, the hospital profit formula emerged from this value proposition to diagnose problems and recommend solutions, requiring expert doctors and equipment organized to maintain flexibility for all problems. In a world where medical understanding still had difficulty predicting outcomes with any certainty, the hospital had to be paid fee-for-service. It had to maximize the utilization of expensive capital equipment. Beds had to be full. More patients, more diagnoses, more tests, and more procedures led to more money, more opportunities for scientific research, more teaching, and more philanthropy dollars.

Our newest policy efforts are attempting to change the profit formula of hospitals with the hope that they will subsequently become lower cost. Unfortunately, the value proposition, resources, and processes present in the business model, which are difficult to change, set the overall cost structure. In the guise of preparing for risk-based payment, hospital systems are recreating a wave of consolidation previously seen in the 1990s, acquiring community hospitals and physician practices often with the goal of capturing and ensuring a patient population for the general hospital at the center of its profit formula. Whether for-profit or nonprofit, all sustainable enterprises have a need to bring in revenues in excess of expenses. Hospitals have not historically been very profitable businesses, with operating margins in the low single digits, so they have little room to give.

Further, we should consider the power and scope of the incentives being offered. Hospital-led ACOs can achieve shared savings by reducing inpatient stays, but these savings to the system also represent lost revenues. Many hospitals are juggling a conflicted profit formula that balances an at-risk population with traditional fee-for-service, reducing the impetus for wholesale change.

The Hospital Business Model Is Difficult to Change

A business model is an interdependent system made up of a value proposition, resources, processes, and a profit formula that ultimately come to determine the capabilities of an organization to deliver a product or service. Once solidified, the elements of a business model determine its capability to succeed where the market conditions match the way it does business and makes money and its inability to take advantage of new opportunities that fall outside its traditional model.

A successful business model begins with a value proposition, a product or service that helps customers do a job more effectively, affordably, and conveniently. Organizations marshal a set of resources—including people, equipment, and supplies—required to fulfill this value proposition. Over time, as employees work with other resources to deliver their product, successful ways of accomplishing tasks coalesce as processes. Together, these resources and processes set the profit model, which defines the pricing, margins, asset turns, and volumes necessary to profitably deliver the value proposition.

Eventually, the resources, processes, and profit formula of an organization come to determine what types of value propositions an organization can and cannot deliver. Only value propositions that fit the existing business model can successfully be introduced to the market as the overhead and priority structure pervade the decision-making of all levels of the organization, including frontline staff and middle management, who each day must determine what is important for the organization and what is not.

Hospital Spending Can Be Reduced with Business Models Whose Capabilities Rely on Processes

In contrast to the traditional hospital business model, which is organized around maximizing the use of costly resources, value-added process (VAP) business models and integrated providers instead rely on efficient processes to achieve their profitability goals and consequently have the ability to lower costs.

Parts of medicine have moved beyond the intuitive stage to a point where the understanding of disease and treatment allows for replicable results. This requires a different business model called a VAP, which has the value proposition of offering an effective, affordable, and convenient solution once it is known what needs to be done. Capabilities in areas like joint replacement, angioplasty, hernia repair, and cataracts have migrated from being determined solely by an expert physician to residing in the equipment and processes that allow repeatable results of high quality. Organizations like the Hoag Orthopedic Institute, the Shouldice Hospital for hernias, and the Aravind Eye Clinic in India deliver superior outcomes, often at a fraction of the price. Instead of requiring flexibility, this model requires resources linked tightly by processes to repeatedly deliver an outcome. Since it avoids the complexity inherent in providing highly custom solutions, the overhead—and consequently, the possible price—in this business model is lower. Because outcomes are predictable, it is possible to pay for a guaranteed outcome, often with a warranty.

Hospitals have gone on to mix their resource-based business focused on diagnosing disease at the frontier of medical knowledge with a VAP that attempts to inexpensively and conveniently deliver the solution a patient has already found out he or she would benefit from. An evolving reimbursement ecosystem reinforced the amalgamation of competing and incompatible business models with usual, customary, and reasonable payments and eventually administratively set prices through government payers who will lead the private sector. In the absence of administered prices, regulation, and philanthropy, general hospitals today would not be competitively or economically viable.[4] We have previously argued the benefits of separating these models, which would lower the cost of care delivery and allow each to integrate and optimize to deliver its value proposition as perfectly as possible.[5]

Integrated health delivery systems similarly share a business model whose key profitability driver is its processes. We offer the definition posed by Singer et al. as "patient care that is coordinated across professionals, facilities, and support systems; continuous over time and between visits; tailored to the patients' needs and preferences; and based on shared responsibility between patient and caregivers for optimizing health."[6] In contrast to consolidated health systems, which have diversified ownership of care facilities but continue to focus on utilization in the expensive hospital setting, the objective of these integrated systems is not only to move care away from costly venues but to reduce the levels of wasteful and inappropriate medical care. These incentives are heightened in fixed fee providers with complete clinical and financial integration, like Kaiser Permanente, but can be strong in systems with less complete integration, like Intermountain Healthcare and Geisinger.

To be clear, integrated care is not a system that owns all provider settings and facilities. It is embedded in the processes that bring together all of the resources, which allows the consistent and coordinated delivery of services from the patient perspective. It focuses not on a single episode of treatment but rather a comprehensive approach to patient health.

A report by McKinsey, a global consultancy, breaks down integration into three categories. Integration between primary care and secondary care aims to provide a one-stop shop for clinical services.[7] Efforts include improving

care coordination and ensuring appropriate use of health resources. Integration between health care and community care looks to coordinate a wider range of services, including social service and community care. Efforts include managing discharge to lower acuity settings like skilled nursing and inpatient or home rehab. Integration between payers and providers hopes to better align incentives to maximize quality while lowering cost.

Why Integrated Systems Have Failed to Expand

When Mayo Clinic opened campuses in Jacksonville, Florida, in 1983 and then in Scottsdale, Arizona, in 1987, some thought it would be the start of a national expansion. Kaiser Permanente once had ambitious expansion too. Though it now operates in seven regions nationally, it saw heavy losses in failed expansions to the Northeast, North Carolina, and Texas and exited the Ohio market in 2013. If integrated systems, by virtue of their business model, are able to develop cost advantages over traditional provider models, why have these systems failed to expand their efficient organizations nationally, displacing providers in other markets? Integrated systems face particular challenges both in expanding their systems through acquisition in new markets as well as through constructing entirely new facilities. When acquiring existing providers to enter a new market, integrated providers face the difficult and resource-intensive challenge of changing existing culture and processes to replicate the integrated approach to care. Building new facilities to enter a market faces the additional challenges as early lack of scale often forces integrated providers to contract out to other providers, breaking their integrated model, which adversely affects the cost and quality levels necessary to reach scale.

Recent moves toward hospital system consolidation have primarily occurred through mergers and acquisitions. Nonintegrated providers have been able to amass increasing market power simply by buying their local competitors and forming larger networks. Integrated providers have not been as active in acquiring competitors. Mayo Clinic chief financial officer Jeff Bolton offered this explanation as to why:

> But the real thing that we found was that the integration into the Mayo culture was a "heavy lift." We had to devote a ton of resources to bring these organizations into the Mayo Clinic model of care.[8]

Nonintegrated providers buy competitors that typically have similar business models. The merger goal is typically to acquire their competitors' resources, facilities, employees, and patients in order to increase market power. Here, processes and culture can easily merge into the acquirer's because of their similarity and do not typically provide the key justification for merger value.

Integrated providers value resources as well when entering a new market through acquisition. However, the processes and culture already in place are likely highly dissimilar to those of the acquirer. Since the integrated business model relies on processes, putting those processes into the acquired provider system is critically important. This is a resource-intensive process that requires the concentrated attention of the integrated system's management as well as clinical staff to replicate the culture and way of doing things into the new system. Clinical practice has often been set for a considerable period of time already, and changing it has proven especially difficult.

Integrated models face further challenges in scaling their model in a new market, whether entering by acquisition or by building new facilities. The projects typically require significant capital outlays because it is necessary to build and own a minimum scale of medical facilities to cover a geographic region for the integrated

model to work. Nonintegrated providers can easily use existing primary care, specialist, and hospital networks as these entities easily plug into the modular network and reduce capital needs. Because integrated providers are reliant on managing the entire process and experience across their spectrum of care, utilizing the services of existing players does not allow for the cost and quality advantages that integrated providers rely on.

The initial strategy typically starts with an initial nucleus of owned facilities with a network of contracted providers to cover the geography. The hope is to build additional facilities and begin offering more specialty care as the network grows, allowing the system to reduce reliance on contracted providers.

The systems are then put under pressure to scale to reach profitability and cover the costs of the expansion. The lack of scale in itself makes success even harder to achieve. Because the system lacks purchasing power, it is not able to achieve favorable rates from hospitals, primary care physicians, and specialists with which it must contract. Without concentration, the system lacks brand recognition among potential customers, making the job of adding customers difficult. Given customer demand for coverage within a certain geography and for certain services, the system has no choice but to contract out.

Instead of adding scale and further integrating in a virtuous cycle, these pressures to scale lead the system to break the integrated model to offer an acceptable product. Primary care costs rise as it is more difficult to implement care protocols in unemployed physicians. Specialty care costs rise similarly, without the advantage of integrated protocols and due to the lack of bargaining power on pricing. This leads to a downward spiral as service levels suffer without integration between primary and specialty care within a small network. Reputation suffers, and high prices from contracted partners make scaling the region even more difficult. The system has a hard time reaching the necessary scale to provide quality service with the cost advantage allowed by its business model.

These factors do not make the geographic expansion of integrated providers impossible. On the contrary, Kaiser Permanente is continuing its plans for expansion and has had successful expansions in addition to its failures. Rather, this process is difficult and resource intensive. A critical mass of patients is a necessity for success, which may be hard to find in many markets that are already crowded. Integrated providers may continue to expand incrementally but cannot be relied on to scale their model at scale nationally.

Integrating Nonintegrated Providers

If integrated providers are unable to scale geographically, American provider spending will remain largely in the control of systems that are currently not integrated. The current business model of these providers, which relies on leveraging increasing resources to provide more services, will be inadequate to control costs in health care. These providers, though, face a challenging new situation. Both public and private players are shifting payment models away from fee-for-service, the profit model on which nonintegrated providers have largely optimized around, to alternative models that tie payment to quality and value. The US Department of Health and Human Services intends for payment through alternative payment models that focus on population health management instead of payment for specific services to increase from 30 percent in 2016 to 50 percent in 2018.[9] Private insurers like Blue Cross Blue Shield, Aetna, and UnitedHealth spent between 20 and 30 percent of dollars in value-based contracts in 2015.[10] This is a trend that both payers and providers think will increase over time.[11] The way that these organizations make money, their profit formula, is changing because of forces beyond their control. Their challenge will be to transform the

processes that made them successful in the fee-for-service world into a largely different set of processes that will allow success in a world based on value.

This crisis provides an opportunity for coordinated action that will require senior leadership to lay out a vision for the organization's future. In the world before value-based payments, there was agreement along two dimensions: what people in the organization wanted and how the world works. Health care organizations have been generally aligned on goals that might include excellence in patient care, research, and teaching. In the fee-for-service world, there was general agreement on how the world worked as well. The organization was optimized for productivity, seeing more patients while having the best clinical staff and the latest equipment attracted volume and attractive pricing. With agreement on these two fronts, organizations were able to continue on with the culture built on the repetition of the way of doing things that had made them successful.

In a world where nonintegrated providers must adapt to the introduction of value-based payment, the notion of how the world works is thrown on its head. No longer is volume and increasingly sophisticated equipment the answer to fulfilling the mission. Here, the culture breaks down. The old way of doing things is not the way to be successful in the future.

However, what remains is a vision of what the organization wants. Though groups within health care provider organizations may hold differing intensities of preference, there is general agreement on the mission of these organizations. In a world where organizations agree that they want to remain financially viable enough to deliver their clinical care, research, or teaching mission but do not agree how to achieve that, tools of leadership—not culture—are needed. Some may think it best to continue the organization the way it has been. Others may want to change the current model radically. Leaders must lay out a vision of where the organization wants to go rather than focusing intensively on the process of how to get there. As agreement forms on the process steps necessary to achieve that vision, management can implement them as part of the vision. For example, there is a consensus that new IT systems are necessary to implement value-based payments, but this challenge is not a challenge of leadership but one of management. Figure 1[12] depicts these dimensions of agreement and the most effective tools in each situation.

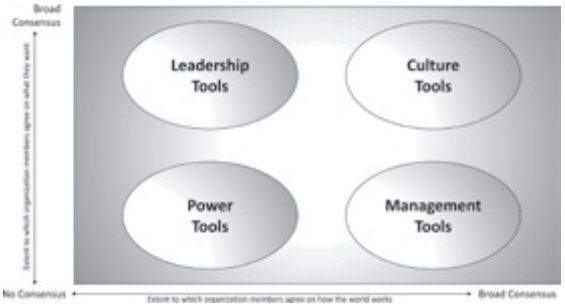

Figure 1. Visualizing the existing levels of agreement and the tools of cooperation

If leaders decide that an integrated model is the best way to achieve their organization's goals, vision and leadership will not be sufficient. Assigning experienced managers to the situation will not be enough in a situation where the new model conflicts with the old. Figure 2[13] offers a framework to help leaders decide how they can successfully leverage their current organizational capabilities in changing their business model. The left axis measures the extent to which existing processes will be the ones that will lead to success in the future. The horizontal axis asks leaders whether the organization's values will allocate to the new initiative the resources it will need to be successful. That is, given the way the organization currently makes money, will the new opportunity seem attractive?

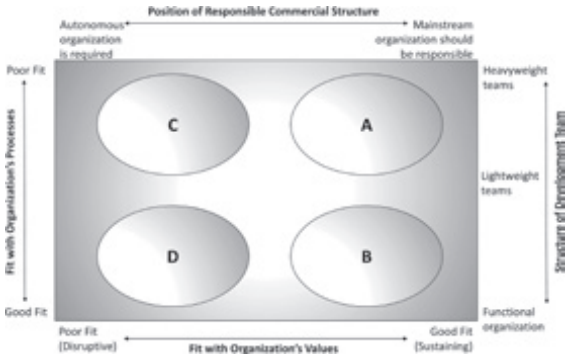

Figure 2. A framework for finding the right organizational structure and home

If leaders decide to move to an integrated model, it is already clear that the current processes will not be the ones that will lead to future success. The question remains, then, whether the existing business will find the opportunity attractive. This will largely be a function of the local payer mix and their progress toward alternative payment models. Organizations that wish to integrate but have few payers pushing new payment models will find themselves in region C. An autonomous organization that exists separately from the current business will be required to develop the new processes necessary for success. If current payers pay with the old model, the existing organization will seem to work well and the new models poorly. Existing managers and staff will not prioritize the new processes and business model because the current one is doing well. A separate organization that can develop the processes necessary when the shift comes must remain apart from the pressures and existing processes of the old organization.

Most organizations now will find themselves in region A. Major payers are increasingly demanding alternative payment models in which the old model is not optimized for success. Those demands are so great that they can no longer be ignored by the organization, though new processes will be needed for success going forward. Here, heavyweight teams will be necessary. This refers to a group of people who are pulled out of their functional organizations and placed in a team structure that allows them to interact in different ways and with different groups than they would habitually work with.[13] Their goal is to create new processes or new ways of working together.

For example, if thinking of new ways to integrate around low back pain, an organization might pull together primary care physicians, physical therapists, social workers, nurses, pain management physicians, radiologists, spine surgeons, psychiatrists, anesthesiologists, pharmacists, schedulers, and other frontline staff to design a new integrated process around spine care. In a nonintegrated model, these people would typically work relative silos across multiple care settings, which was an effective model in a fee-for-service payment system. To integrate and compete successfully in value-based models, these individuals must develop new processes that organize and coordinate care rather than maximize the utilization of each resource. This may lead to shifts in organizational structure, as seen when Cleveland Clinic reorganized around institutes that focused on certain disease areas and conditions rather than medical specialties. In doing so, it moved together clinical staff across disciplines that focused on particular areas, developing new processes for coordinated care.

Integrated Systems Can Enable Disruption and Profit from Reduced Prices

Integrated systems may play an even more important role in reducing health care costs as an enabling value network for disruptive innovation. The theory of disruptive innovation explains how complicated, expensive products and services are eventually converted into simpler, more affordable ones.[14] Sustaining innovations lead to better products that can be sold for higher profits to the best customers. In contrast, disruptive innovations are usually not as good as what existing customers are using, but because the new product is usually

simpler, more convenient, and more affordable, it enables a new set of customers who didn't have the money or expertise to enjoy it. Because these disruptive products do not appeal to a company's best customers paying the highest prices, they are almost always introduced by new entrants rather than dominant incumbents in the industry. Once a disruptive product takes hold, it begins to improve over time and eventually takes away the customers of the leading companies.

In health care delivery, disruptive innovations will push care increasingly closer to patients and away from expensive care settings and consequently have exceptional potential to lower costs. Still, disruptive innovations do not occur in a vacuum but are plugged into the existing ecosystem. A value network is a context within which a firm establishes a business model and how it can work with suppliers and distributors to meet the common needs of its customers. Organizations in a value network tend to share complementary business models that determine the value they can derive from working together.

Companies with disruptive business models in health care delivery are already searching for a home. Traditional hospital systems are a poor fit for businesses built around delivering care in a less expensive setting. Rather, companies like Omada Health—a provider of digital evidence-based diabetes prevention—and Doctor on Demand—a telemedicine company—have either targeted or pivoted to the self-insured employer market. Like integrated health providers, they have a strong incentive to bring care to the least expensive effective venue and have been a strong initial customer for disruptive health services.

However, these employers typically don't want to be in health care. They have been forced to by the necessity of controlling health care costs. Integrated providers want to be in the business of taking care of people's health and, especially where providers take a fixed fee, have strong incentives to support, contract with, and acquire businesses disruptive to the traditional hospital model because they align with the goal of pushing care to the least expensive setting.

Traditional hospitals, even in the face of new incentives, will find it exceedingly difficult to lower their cost structure in a business model design to utilize resources. Rather, cost efficiencies will be driven by business models like VAP and integrated delivery systems, which rely on processes to increase operational efficiency, reduce wasteful care, and shift care to the lowest care setting. Current integrated models will continue to find it difficult to expand geographically. Thus, nonintegrated providers have an opportunity to change their business model to focus more on processes that coordinate care, which will be the key to future success. Integrated delivery systems have an additional opportunity to serve as an enabling value network for companies with business models disruptive to traditional hospitals but aligned with the goal of lowering costs while pushing care increasingly closer to the patient.

Impact on Surgeons

The bottom line is that hospitals are concerned about making money for the hospital. Their goal is to extract as much value as possible from their surgical employees or private practice negotiated agreements. At times, this relationship can be symbiotic. The neurosurgeon creates value for the hospital system, and the hospital system will reward that productivity. This includes services rendered but also ancillary income, trauma status, etc. However, it is in the hospital's best interest to extract that value at the lowest possible cost. Friction from this model will always exist.

Productivity bonuses and call pay remain salient examples of negotiated reimbursement platforms. However, other applications remain potent. The advent of bundled payments and the integrator model produce new challenges to surgeons. The neurosurgeon or spine sur-

geon must be flexible and adaptable. The neurosurgeon will no longer be an omnipotent subject matter expert but rather a team player within a proven process.

How can surgeons provide the best possible care for their patients in an integrated model? Focus must remain on control of the integrator model. Whoever controls the bundled payment or controls the delivered integration will determine quality and outcomes. Hospital systems currently working to control delivery will completely revolutionize the volume-driven work relative value unit payment algorithm. The neurosurgeon will no longer become an income-generating asset. Rather, the neurosurgeon will function as a cost item. The goal for a hospital system in an integrated model with a bundled payment method would be to find the lowest bidder that can meet the rather loose standards of quality. This is currently underway in orthopedics; bundled payment, tasked to the hospital, went live for lower extremity orthopedic surgery in 2016.

Conclusion

Integrated delivery systems for neurosurgical care will enable a better creation of value in the healthcare space. It remains essential that business models become not just disruptive to traditional hospitals but aligned with the goal of lowering costs while pushing care increasingly closer to the patient. Spine surgeons and neurosurgeons must remain active partners in the discussions surrounding these developments.

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