

By James C. Robinson

Case Studies Of Orthopedic Surgery In California: The Virtues Of Care Coordination Versus Specialization

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ABSTRACT Two overarching frameworks compete to address the organizational ills of the health care system. One framework diagnoses lack of coordination and prescribes integration and global payment. The other diagnoses loss of focus and prescribes specialization and episode payment. This article, based on research and interviews, assesses how the two frameworks manifest themselves at two high-volume orthopedic hospitals in Irvine, California. The Kaiser Permanente Irvine Medical Center is part of a large and diversified health system. The Hoag Orthopedic Institute is a single-specialty facility jointly owned by the physicians and the hospital. Market outcomes, such as the merger of the Hoag specialty hospital into a larger diversified health system, suggest that Kaiser's focus on coordination of patient care from preadmission to postdischarge is a key factor in its success. But Hoag's specialization also leads to improved efficiencies. The integrated approach appears to be prevailing. At the same time, large diversified organizations might obtain further efficiencies by pursuing service-line strategies as described in this article—for instance, by providing incentives for efficiency and quality for each specialty and type of care.

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Two frameworks compete to interpret and remediate the ills of the US health care system. The first diagnoses the system's central problem as organizational fragmentation and lack of clinical coordination, and it prescribes integration into group practices and hospital systems reimbursed on the basis of global payment. Traditionally associated with the work of Alain Enthoven,¹ this framework is partially exemplified by Geisinger Health System and other diversified organizations that combine physician groups and hospital systems.² It underlies the Affordable Care Act's emphasis on accountable care organizations.

The alternative framework diagnoses the problem afflicting health care as excessive consolidation and loss of clinical focus, and it prescribes a

streamlining of health care organization into specialty hospitals and ambulatory care centers that are reimbursed based on episodes of care. Traditionally associated with the work of Michael Porter,³ this second framework is partially exemplified by the New York Hospital for Special Surgery and other condition-specific organizations.⁴ It underlies the Affordable Care Act's emphasis on episode payment.

It is too early to predict which organizational form and policy framework will prevail under the Affordable Care Act—and, in fact, as this article describes, the two frameworks appear to be blending into one. Preliminary insights can be obtained, however, from case studies of organizations that exemplify each of the frameworks and compete directly with one another. Case studies permit in-depth comparisons of strategy,

structure, and performance and also offer insights into how the models evolve under pressures in the market.

Orthopedic Surgery Case Study

This article compares the organizational, financial, and clinical design of orthopedic surgery in Kaiser Permanente, the nation's paradigmatic integrated delivery system, with that of the Hoag Orthopedic Institute, a renowned specialty facility.

Although Kaiser operates in numerous localities, its Irvine Medical Center in California has led the system in the redesign of surgical processes and related clinical pathways. The Hoag Orthopedic Institute provides the most knee and hip replacement surgeries in California and is a prominent participant in health plan initiatives to promote episode-of-care payment.

Kaiser's Irvine Medical Center and the Hoag Orthopedic Institute opened their facilities in the same year. They are located across the street from one another, and they compete head to head.⁵

I conducted a two-year case study that included more than one hundred interviews with senior executives, midlevel managers, practicing surgeons, and nonphysician staff at Kaiser, Hoag, and other health plans and hospital systems in the same market.

Interviewees included orthopedic surgeons and people with responsibilities in organizational strategy, operating room management, medical implant purchasing, clinical pathway development, quality improvement, postsurgical care and discharge planning, managed care contracting, marketing, and business development.

I found similarities and differences between the two organizations with respect to physician financial incentives, operating room processes, postsurgical care, osteoarthritis disease management, and patient selection for surgery. I conclude that the market appears to be favoring diversified organizations over more narrowly focused service-specific organizations. The economies of scale and scope obtained from integration appear to outweigh the economies of focus and experience obtained from specialization.

Organizational Structure: Diversification Versus Focus

KAISER Kaiser has a strong presence in California, with more than seven million enrollees in the state and 435,000 in Orange County. The organization's market share has been growing among commercially insured people,

Medicare beneficiaries, and Medicaid enrollees.

In 2010 it constructed a 250-bed facility in Irvine, which serves as its referral center for orthopedic knee and hip replacement surgery as well as a general acute care hospital for southern Orange County. The Irvine Medical Center's twenty-one orthopedic surgeons perform 900 total joint replacements and 4,700 other orthopedic procedures annually. Neurosurgery and orthopedic spine procedures are performed at other Kaiser hospitals.

The Kaiser health plan contracts with the multispecialty Permanente Medical Group in each geographic region, paying the medical group on a capitation, per member per month global basis for all professional services. Nonclinical services, including orthopedic implants and other medical devices, are paid out of the hospital budget and are not included in the medical group capitation.

Individual physicians are partners or employees of the Permanente Medical Group and are paid on a salaried basis with modest bonus opportunities based on achievement of quality and patient satisfaction targets. They do not have an ownership stake in the nonprofit Kaiser system; are not paid for procedures on a fee-for-service basis; and do not participate in financial gain sharing, where additional incentives are paid to physicians if hospital costs are reduced. Physicians in the Permanente Medical Group are forbidden to consult with firms that sell orthopedic and other medical devices to the Kaiser system.

Some hospital administrators fear that device representatives use their relationships with surgeons to promote the most expensive devices—a practice called up-selling.⁶ This concern is addressed at the Permanente Medical Group by an absolute ban on physician consulting and remuneration from device firms.⁷ Kaiser Permanente finds that in consideration of the high volume of devices it purchases annually, device manufacturers are willing to forgo aggressive sales techniques, and the system will terminate arrangements with distributors if they threaten the larger relationship.

HOAG ORTHOPEDIC INSTITUTE Hoag Memorial Hospital Presbyterian, a nonprofit entity, provides a full range of clinical services through two inpatient hospitals, twelve community-based clinics and urgent care facilities, specialized service lines in cardiovascular medicine, neuroscience, women's health, and orthopedics, and numerous affiliated physician offices in Orange County.

In 2010 the hospital created a for-profit subsidiary, the Hoag Orthopedic Institute, as a joint venture with two large orthopedic surgery

medical groups. The institute's ownership was divided, 51 percent for the hospital and 49 percent for the physicians. The institute includes a specialty hospital with seventy inpatient beds and two ambulatory surgery centers in neighboring communities. The institute's medical staff includes forty-two orthopedic surgeons, who perform 4,300 knee and hip replacement procedures and 12,000 arthroscopic, spine, trauma, and peripheral orthopedic surgeries per year.

Hoag is a leading participant, with health plans and self-insured employers, in initiatives to develop episode-of-care payment, reference-priced benefit designs, and narrow network insurance products. Episode-of-care payment combines the reimbursement for the hospital, expensive implanted devices, the physicians, and some elements of postdischarge care into a single payment, thereby aligning incentives for efficiency. Reference pricing is a health insurance benefit design that requires enrollees to pay out of their own pockets the difference between the insurer's maximum payment and the price actually charged by the hospital, thereby giving the enrollee the incentive to select a low-price hospital. Narrow network insurance products limit their contracts to a subset of hospitals that are willing to discount their prices to the insurer in exchange for higher patient volume.

Hoag seeks to become a center for major procedures for which commercially insured patients would be willing to travel—not only for orthopedics, but also for interventional cardiology, electrophysiology, women's health, and oncology. Establishing the subsidiary orthopedic institute represents its most fully developed expression of this regional center of excellence strategy. Some insurers designate particular hospitals as centers of excellence for particular procedures if documented quality is high and negotiated prices are low.

The joint-venture Hoag Orthopedic Institute builds on the model of physician-owned ambulatory surgery centers, which represent the surgeons' interests in obtaining equity ownership and a share in the profitability of the facilities where they provide care. The physicians are not employed by Hoag; instead, they are owners and partners in the surgical medical groups. Physicians are paid for their professional services on a fee-for-service basis, with most patients covered by traditional Medicare or commercial preferred provider organization insurance, both of which also pay on a fee-for-service basis.

As equity owners in the Hoag Orthopedic Institute, physicians share in the profits earned by the specialty hospital and hence face gain sharing-type incentives for reducing the costs

of implanted devices and other aspects of the care process. Many of the surgeons perform consulting work for orthopedic device firms, including those that sell to the institute, but they are required to comply with strict disclosure rules when involved in device contracting and price negotiations.

Although the Affordable Care Act banned physician-owned specialty hospitals, Hoag Orthopedic Institute was grandfathered into the legislation by special request.

Surgical And Postsurgical Processes

HOAG ORTHOPEDIC INSTITUTE The formation of the Hoag Orthopedic Institute embodies the principle that entities can best achieve clinical quality and efficiency by focusing on a limited range of clinical procedures. In so doing, they reduce the complexity that impedes performance in organizations that attempt to offer all services to all patients.

A primary objective of the institute's founders was to streamline the process of care to maximize the number as well as the quality of procedures that can be done per surgeon, per operating room, and per day. The broader goal was to build the infrastructure for referral volume growth.

The Hoag Orthopedic Institute's operating rooms now handle five joint replacement procedures per day, with peripheral orthopedic procedures, such as knee arthroscopy and shoulder surgery, done primarily in the affiliated ambulatory centers. The institute's surgeons are pioneers in the development of ambulatory surgery for total hip replacement, reducing the length-of-stay to an average of twenty-three hours for uncomplicated cases.

The institute streamlines orthopedic surgery and operating room processes by selecting highly motivated physicians and by ensuring that those surgeons accept the facility's clinical processes. Everything is standardized: methods of patient education and preparation prior to surgery, operating room schedules, procedure timing, staffing, the role of implant manufacturer representatives in the operating room, pain medication protocols, laboratory testing and radiology protocols, patient diet, and physical therapy. This standardization constitutes a major change in culture for traditionally autonomous orthopedic surgeons.

The Hoag institute has taken over discharge planning functions from the individual physicians as well as from the health plans in the local market. A nurse navigator is assigned to each patient for the entire course of care, from preadmission preparation to postdischarge re-

ferral. This assistance facilitates the transitions from surgery to subacute care, rehabilitation, skilled nursing, or home care, which are often confusing to patients.

The institute is paid by Medicare on the basis of diagnosis-related groups and by most commercial insurers on a case-rate basis, giving the organization strong incentives to reduce patient length-of-stay as well as the cost of surgical implants. The institute does not serve many managed care patients from Medicare Advantage, Medicaid, or commercial health maintenance organization plans.

KAISER Rapid growth in enrollment, combined with obesity-driven growth in population-based knee and hip replacement rates, has led to concerns about demand for surgery outpacing capacity at Kaiser in the Orange County market. The health plan has partly alleviated such stresses by opening Irvine Medical Center and by continually recruiting new surgeons, but it has identified long wait times for discretionary procedures as a potential source of enrollee dissatisfaction.

In 2010 Kaiser contracted with the medical device firm DePuy, an affiliate of Johnson & Johnson, to conduct an assessment of and help restructure Irvine Medical Center's operating room scheduling, room preparation, procedure cut-to-close times, and postsurgical management. The assessment incorporated principles of parallel processing and Lean manufacturing⁵ and led to a complete redesign of operating room protocols.

The Kaiser Irvine team developed what it refers to as the "total joint dance"—a set of well-choreographed operating room procedures and postoperative processes. The standard two-day length-of-stay is now broken down into hourly segments, and the exact role and timing of antibiotics, pain medications, physical therapy, and patient mobilization are specified.

In orthopedic surgery, operating room scrub and circulating nurses, operating room technicians, device firm representatives, and other team members have a strong influence on the rate at which patients are prepared and procedures are conducted, and on the rate at which the operating room is turned around for the next patient. At Irvine Medical Center, each surgeon develops his or her team of these personnel, to promote consistency and to reduce the need for relearning routine processes.

Discharge planning begins prior to admission and continues after surgery based on outcomes and patient preferences. Physicians at Irvine Medical Center conduct postsurgical care and patient management at contracting subacute, rehabilitation, and skilled nursing facilities,

even though the system does not own these entities. Patients are not discharged from the hospital until follow-up appointments have been scheduled with both the surgeon and the primary care physician.

In summary, both Hoag and Kaiser maintain a strong focus on productivity and patient throughput. Hoag pursues process efficiency to maximize surgeon and operating room capacity in order to expand patient volumes and fee-for-service revenues. Because Kaiser pays its physicians on a capitation rather than fee-for-service basis, physicians do not profit from greater volume of services. Instead, Kaiser Irvine surgeons pursue process efficiency because they face capacity constraints from population growth, expansion of insurance coverage, and epidemiological trends.

Patient Selection And Appropriateness Of Care

Hoag and Kaiser face similar incentives to increase the efficiency of their processes. However, incentives differ with respect to selecting candidates for surgery and for managing the underlying disease processes of osteoarthritis.

KAISER After redesigning its operating room and choreographing its postsurgical procedures, Irvine Medical Center turned its attention to patient selection and care management for osteoarthritis—the chronic illness that most often underlies patient requests for joint replacement. Disease management is delegated by the Kaiser insurance plan to the Permanente Medical Groups in each market.

Prior to the redesign, patients sought care themselves in the surgery clinic or were referred by primary care physicians without prior triage. Many of these patients were passive and uninformed about the role of lifestyle choices on functional ability, and many had been treated with different combinations of analgesic drugs, steroids, and counseling and had not received care according to formalized, evidence-based standards. Permanente surgeons were therefore spending a considerable amount of time assessing patient disease severity, functional limitations, attitudes toward surgery, and willingness to make behavioral changes, such as losing weight. None of these functions is primarily surgical in nature.

In 2011 the orthopedics department at Irvine Medical Center launched the "osteoarthritis care pathway." The patients were divided into three categories depending on stage of osteoarthritis and interest in surgery.

First, patients without active disease but at risk for eventual surgery were triaged to behavior

change and early intervention programs coordinated by their primary care physicians and wellness coaches. Second, at the other end of the spectrum, patients who had failed prior interventions and who sought surgery were triaged into the surgical preparation pathway, with emphasis on education, preoperative weight loss, diabetes management, and planning for postoperative care. Third, the osteoarthritis pathway was developed for patients who were not yet candidates for surgery but who needed to manage their pain, improve functioning, and prevent the progression of their disease.

Kaiser Irvine developed a clinical pathway for each of the three types of patient, emphasizing the roles of primary care physicians, nurse practitioners, physical therapists, and wellness coaches. It also modified existing clinical guidelines on drug management, radiography, injection of steroids, exercise and weight loss, referral to bariatric surgery, nutritional counseling, and physical therapy, and it standardized the flow of patients through those options and processes. The intent was to limit the need for surgery by preventing disease progression and to limit surgeons' involvement in nonsurgical processes.

HOAG ORTHOPEDIC INSTITUTE The Hoag Orthopedic Institute is a hospital and set of ambulatory surgery centers. As such, it is structured to provide care to patients who seek surgery. Patient selection and appropriateness criteria fall within the authority and practices of the individual surgeons, not the orthopedic hospital. The institute needs to promote process standardization while respecting physician autonomy. The surgeons are highly skilled practitioners, the source of new patient volume, and equity partners in the facility; they cannot be required to adhere to clinical pathways they do not embrace.

The Hoag Orthopedic Institute specialty hospital, as an organization, has strong financial incentives and quality reasons to standardize care processes, but it has neither incentive nor cultural authority to standardize the way in which the surgeons and referring primary care physicians decide which patients are good surgical candidates. The facility is paid on a case-rate basis—a pricing method in which a flat amount covers a defined group of procedures and services. The surgeons are paid via fee-for-service. The Hoag institute does not reap a return on investment in nonsurgical care management for chronic illnesses. Therefore, it does not engage in chronic disease management.

Although the Hoag Orthopedic Institute is not structured to provide ongoing care for patients with chronic illnesses, the two surgeon groups provide nonsurgical care for patients suffering

from arthritic disease and disability outside of the hospital context. The Newport Orthopedic Institute, one of the two Hoag-affiliated medical groups, has expanded its scope of care into primary care treatment of osteoarthritis, having hired a family practice physician who has advanced training in sports medicine and orthopedics. This physician assesses patients who seek care at the Newport Orthopedic Institute and provides pain management, coordinates physical therapy, and refers patients to diagnostic radiology.

The Newport Orthopedic Institute employs physician assistants and numerous technicians to ensure that surgeons can focus their time on surgery rather than on nonsurgical care.⁷ An organizational principle is that each type of care should be provided by the least expensive level of clinician and facility that can achieve quality standards.

As previously mentioned, the individual surgeons are responsible for assessing the candidacy of individual patients for surgery. These appropriateness reviews are not coordinated with the medical management initiatives at the health insurance plans or the primary care-based medical groups with which some of the patients are affiliated.

The Virtues Of Focus And Specialization

The Hoag Orthopedic Institute constitutes a center of excellence focused on a high-volume service line, for which it publishes extensive quality performance metrics and is paid on a case-rate or episode-of-care basis. It pursues a cycle of strong performance, increased physician affiliations and patient volume, and further experience-based performance improvement. Its business model assumes that patients have choices among competing hospitals and that insurance network contracting and benefit designs do not channel volume away from the specialized facility toward general-purpose hospitals.

The Hoag Orthopedic Institute is a revenue center for the larger Hoag hospital system, with each patient bringing in revenue that pays surgeons' fees and facility overhead and contributes to the return on investment for the hospital and the medical groups.⁸ Marketing for local growth has centered on attracting surgeons who have established patient practices with attractive insurance coverage, especially commercial preferred provider organization insurance.

The orthopedic institute treats many Medicare fee-for-service patients, but payment rates are so low that it is not actively seeking to expand that patient population. The institute has declined

to participate in the Center for Medicare and Medicaid Innovation demonstration project for orthopedic surgery that would channel greater patient volume to facilities in exchange for further fee discounts.⁹ The institute is not willing to accept even lower payment rates from Medicare than it already receives.

The Hoag institute's major growth opportunity lies in reaching beyond Orange County to Los Angeles, San Diego, and more distant markets to attract patients willing to travel for elective surgery. The institute was an early proponent of bundled payment; reporting of quality outcomes; and travel medicine, in which patients seek care outside their home community.

Unlike many of the other hospitals in the market, the Hoag Orthopedic Institute accepts case rates as a prototype for the episode-of-care pricing that it sees as the logical form of payment for hospitals competing on a regional basis. Although most hospitals exclude the cost of the orthopedic implant devices from their per case rates and insist on being reimbursed by the health plans on a supplemental fee-for-service basis, the Hoag institute allows most health plans to include the implants in its case rates.

In moving from case rates to episode-of-care payment, the institute has taken a leading role in the bundled payment initiative with Aetna, Blue Shield of California, and the Integrated Healthcare Association. This initiative bundles into a single payment the orthopedic implant, physicians' clinical fees, all facility costs, and related hospital readmissions within thirty days of discharge.

Challenges Facing Specialty Organizations

The general trend in the California health care market is for hospitals and medical groups to consolidate and to contract with insurers for all care of the patients affiliated with the medical groups' primary care physicians. This population-based contracting—a long-standing feature of commercial and Medicare Advantage health maintenance organization plans—is expanding into the commercial preferred provider and Medicare fee-for-service plans as they embrace new payment models under the accountable care organization rubric.¹⁰

A challenge facing the Hoag Orthopedic Institute is the potential erosion of its primary care referral base. Although the institute scored a major coup in attracting an orthopedic surgery group from its primary competitor, St. Joseph of Orange, the latter system has been steadily increasing the employment of primary care physicians through its Heritage multispecialty group

practice.

Greater Newport Physicians, an independent practice association formerly associated with Hoag, recently was acquired by another major competitor, MemorialCare Health System. If Hoag and its orthopedic institute had not moved upstream into population-based care by joining with the multispecialty St. Joseph health system, they would have been relegated to an unattractive position further down the financial food chain.

The Hoag Orthopedic Institute has traditionally focused on preferred provider organization enrollees, because such plans pay attractive rates. But the rise in health insurance premiums is leading to an increase in forms of consumer cost sharing that dampen patient interest in discretionary orthopedic procedures. The institute's reliance on preferred provider organization insurance makes it particularly vulnerable to the increases in deductibles. Some Hoag surgeons refuse to accept health maintenance organization patients, even though the penetration of these managed care plans remains strong in the local market and is likely to expand as the Affordable Care Act is implemented.

The Virtues Of Integration

Although diversification and specialization represent two distinct organizational strategies, they appear to be blending into one another in health care. The marketplace importance of organizational integration is evident in the evolution of specialty-focused firms. After years of pursuing service-line specialization, Hoag Memorial Hospital Presbyterian recently merged with and formed an integrated, diversified organization with the St. Joseph of Orange health system. The new entity will have six hospitals in Orange County, including the Hoag Orthopedic Institute, and will be the county's largest provider of inpatient care.

St. Joseph owns a large multispecialty medical group and has a strong commitment to capitation payment. It has developed an accountable care organization structure with one of the largest health plans in the market, covering both health maintenance organization and preferred provider organization patients.

St. Joseph has long viewed Kaiser Permanente as its primary competitor and has modeled its strategy and structure on the Kaiser system. St. Joseph consciously dismissed the strategy of forming specialty hospitals paid on a fee-for-service basis, deciding to pursue a strategy of multispecialty organization and capitation payment.

A major impetus for St. Joseph in the merger

with Hoag was to obtain the efficiencies of specialization within its service lines without sacrificing the larger strategy of diversification. It recognizes the importance of service-line focus within the integration strategy. St. Joseph has chosen to participate in the Center for Medicare and Medicaid Innovation bundled payment initiative for orthopedic surgery even as it continues to embrace global capitation payment for all its affiliated patients and services.

Challenges Facing Integrated Organizations

Integrated and diversified organizations face the risk that particular service lines will be neglected, that low-performing units will be allowed to coast on the coattails of the larger entity, and that high-performing units may be unable to disseminate their innovations in the face of bureaucratic indifference. A large non-profit system with salaried physicians must struggle to achieve a level of physician productivity and entrepreneurship comparable to that of systems whose physicians are rewarded by fee-for-service reimbursement and equity ownership.

Kaiser Permanente traditionally does not seek to reward performance at the unit and specialty level. It has recognized, however, that the market pressures for efficiency must be transmitted to each of its specialties and service lines. Kaiser Permanente is now implementing Irvine Medical Center's orthopedic redesign principles at its other hospitals. The "choreographic" approach has been applied to cataract removal and bariatric surgery as well as selected high-volume

medical procedures. However, standardization has proved difficult to implement in general surgery and trauma care, where there is high variance in patient conditions and surgical techniques.

Conclusion

There is an ongoing debate about whether to pursue the path of organizational integration—as embodied in proposals for global payment and accountable care organizations—or the path of organizational focus—as embodied in proposals for episode payment and specialty organizations. These models compete with one another both in the market and in the policy arena. Market competition seems to be resolving in favor of integration, as illustrated by the experiences of Kaiser's Irvine Medical Center and the Hoag Orthopedic Institute. The competition between integration and specialization in the policy arena also seems to be resolving in favor of integration.

Integration and coordination are essential to the reform of the health care system. However, the value of specialization must not be lost. The goal is clinical coordination, not organizational growth and diversification for their own sake.

The efficiencies of specialization can be obtained by integrated health care organizations only if the larger entity does not stifle its physicians and facilities with bureaucratic supervision and a weakening of local accountability. The battle for efficiency is won or lost in each surgical procedure, each service line, and the course of care for each patient. ■

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NOTES

- 1 Alain Enthoven has consulted with Kaiser Permanente over many aspects of its organizational strategy, including regionalization to achieve efficiencies of scale and experience. See Arrow K, Auerbach A, Bertko J, Brownlee S, Casalino LP, Cooper J, et al. Towards a 21st century health care system: recommendations for health care reform. *Ann Intern Med.* 2009;150(7):493–5.
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- 8 A small percentage of patients treated at the Hoag Orthopedic Institute are covered through subcapitation payments from a local independent practice association to the Newport Orthopedic Institute medical group. Additional procedures performed for these patients do not bring additional revenue to the orthopedic medical group, although the individual surgeon performing the procedure is paid by the group on a fee-for-service basis. Procedures performed on independent practice association patients do bring in additional revenue to the hospital through the case-rate payments.
 - 9 For a description of the Center for Medicare and Medicaid Innovation demonstration on bundled payment, see CMS.gov. Bundled Payments for Care Improvement (BPCI) Initiative: general information [Internet]. Baltimore (MD): Center for Medicare and Medicaid Innovation; [cited 2013 Jan 13]. Available from: <http://www.innovations.cms.gov/initiatives/Bundled-Payments/index.html>
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In this month's *Health Affairs*, James Robinson reports on his case studies of two different approaches to improving health care and constraining costs: on the one hand, greater integration, coordination, and global payment; and on the other, specialization and episode payment. Comparing two high-volume orthopedic hospitals in Irvine, California—a Kaiser Permanente facility and the Hoag Orthopedic Institute, a specialized orthopedic hospital—he concludes that Kaiser's focus on coordination of patient care is a

key factor in its success but that the Hoag institute's specialization also leads to improved efficiencies. Even as the integrated approach appears to be prevailing in the market, Robinson also concludes that large diversified organizations such as Kaiser Permanente might obtain further efficiencies by pursuing the service-line strategies of the Hoag institute.

Robinson, an economist, is the Leonard D. Schaeffer Professor of Health Economics and director of the Berkeley Center for Health Technology at the University of California, Berkeley. He launched the center in 2008 to focus on how insurance and payment influence the development of innovative drugs, biologics, and medical devices. His research and professional activities have centered on the role of insurance coverage and payment methods in influencing the use, pricing,

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Robinson was the editor-in-chief of *Health Affairs* during 2007–08 and now serves as a contributing editor of the journal. He has published more than one hundred peer-reviewed articles in health policy, economics, and clinical journals, including the *New England Journal of Medicine* and the *Journal of the American Medical Association*. Robinson received a doctorate in economics from the University of California, Berkeley.