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improving performance and enhancing innovation with venture investing

Leading health systems are demonstrating how venture investing can extend an organization's reach and effectiveness by helping it to improve the quality of care, diversify revenue streams, and create a flexible and innovative corporate culture.

AT A GLANCE

Venture investing programs can play an important role in reinforcing cultural values of innovation and entrepreneurship by:

> Changing leadership mindsets
> Creating incentives to innovate
> Building innovation skills
> Providing symbolic reinforcement of the importance of innovation in the organization

U.S. health systems face major challenges as government payers and commercial health plans ratchet down prices, private insurers continue to consolidate, care and margins shift from inpatient to outpatient treatment, costs continue to escalate, and drugs and devices consume an increasing portion of the healthcare dollar. Meanwhile, the shift of risk from health insurers to providers through value-based payment has proved to be a long, expensive transformation, requiring development of new physician networks, new care management and delivery systems, new approaches to contracting, and new management disciplines and infrastructure.

To succeed in this challenging environment, many health systems are increasingly turning to venture investing to improve quality of care, increase efficiency, diversify revenue streams, and build more flexible, innovative corporate cultures. U.S. healthcare venture fundraising in 2017 totaled $9.1 billion, the highest level ever and 21 percent above the previous record set in 2015.[a] Of this total, a growing proportion represents investment by

a. Norris, J., Joyce, T., Tolman, C., and Patnalk, R., *Trends in Healthcare Investments and Exits: 2018*, Silicon Valley Bank, January, 2018., https://www.svb.com/healthcare-investments-exits-report/

health systems. And, growth is not likely to slow anytime soon. A recent survey conducted by the American Hospital Association (AHA) and AVIA reports that 72 percent of the 400+ hospitals in the United States with more than 400 beds have already built innovation centers that support venture investing or plan to do so soon.[b]

The discussion that follows includes comments from a 2017 annual interview survey of venture investing by health systems. The 2016 version of the survey documented the substantial scale and rapid growth of health system venture investing.[c] The 2017 survey then sought to understand how health systems use venture activities to support their corporate strategies and spur innovation in their organizations.

Changing Patterns in Venture Investing

Among health systems, the fastest-growing approach to venture investing today differs from past approaches. For many years, academic medical centers and some large community health systems focused on commercializing inventions developed by their researchers and practitioners—what could be called "inside-out" investing. These organizations developed intellectual property (IP) policies for internal innovations that usually included some sharing of benefit with inventors to encourage innovation. The IP policy of Johns Hopkins Medicine in Baltimore, for example, allows inventors to earn 35 percent of annual licensing fees after unreimbursed patent expenses and licensing expense. And the Cleveland Clinic shares 38 percent of licensing fees with inventors.

For some health systems, these commercialization programs have produced a steady flow of internally developed innovations.

The Mayo Clinic, for example, has been investing in and supporting internal ventures for 150 years, producing more than 5,900 disclosures, 5,500 patent filings, and 2,600 licensing agreements.[d] Mayo's recently formed Office of Business Development—which consolidated Mayo Clinic Ventures with its tech transfer, licensing, and corporate strategy groups—sifts through more than 600 ideas per year, turns a handful of them into formal ventures, and provides seed funding for many more.

Like Mayo, the Cleveland Clinic has been promoting internal innovations since its founding and, in 2000, launched formal venture investing under a business unit called Cleveland Clinic Innovations (CCI). Since then, CCI has issued more than 850 patents, executed more than 500 licenses, and helped launch 77 companies. In 2017, the Clinic created a separate unit, Cleveland Clinic Ventures (CCV), to manage its venture investments. Jack Miner, CCV's managing director, notes that 90 percent of CCV's portfolio is invested in IP owned by the health system.

The rapid growth of venture investing over the past few years, however, has been focused more on "outside-in" than "inside-out" investments. Health systems are seeking to achieve their own strategic goals by developing internal venture arms to direct capital toward promising ventures, most of which are invented by others.

The ultimate impact of these investments remains unclear. Whether venture investing will improve health systems' quality and efficiency, accelerate their shift from volume to value, improve their price-performance, or transform them into more leveraged companies with diversified revenue streams remain open questions.

Despite this uncertainty, valuable insights can be gleaned from examining the venture-investing approaches that leading health systems are using to support their corporate strategies and spur innovation in their organizations. The principal strategies they have implemented are:

b. AVIA and American Hospital Association, *Digital Innovation Survey: Executive Report*, 2017.
c. Potter, M.J., Wesslund, R., "Provider Venture Capital Funds," *hfm*, May 2016.

d. Mayo Clinic Ventures web site, accessed September 2017 (ventures.mayoclinic.org/about.php).

Additional Comments From Survey Respondents

Health system leaders responding to the 2017 annual survey on venture investing shared their perspectives on the role of venture activities in supporting their organizations' corporate strategies and spurring innovation. Here are just a few comments regarding key areas of focus within the survey.

On Aligning Venture-Investing Strategies with Corporate Goals

"One hundred percent of our investments have strategic value to Ascension and our other 12 health system investors. This strategic value enables them to benefit from being an investor in these companies *and* from being a customer."

— Matt Hermann, senior managing director, Ascension Ventures, Clayton, Mo.

"Our investments have to be part of the core strategy of the organization. We want to create things that create value for us."

— Rich Roth, chief strategic innovation officer, Dignity Health, San Francisco

"We're less driven by the need to review a huge number of deals than by our desire to identify those key solutions that address core organizational needs. Financial return is secondary to strategic value."

—Jonathan Gordon, director of NewYork Presbyterian (NYP) Ventures

"We're trying to focus on finding solutions to core technical and patient care problems that we can get behind. Our job is much easier than your stereotypical venture fund because we only invest in things we think we are going to use or be a big or the biggest customer of. The point may not be so much to earn higher returns—although we like returns—as to solve strategic problems. The main goal is to drive innovation into the organization."

—Darren Dworkin, CIO of Cedars-Sinai, Los Angeles, and managing director of Summation Health Ventures

On Syndicating Venture Investments

"Once we think we may want to start up a company, we usually consult with potential co-investors to help us make this decision. We prefer to have independent venture firms as lead investors to ensure investment discipline and limit our exposure."

—Jack Miner, managing director, Cleveland Clinic Ventures

On Integrating Venture Activities With Operational and Clinical Activities

"You can't allow health system bureaucracies to move so slowly they crush ventures. Interminable piloting is a disservice that health systems perpetrate on entrepreneurs. Early-stage companies spend too much time piloting."

— Matt Hermann, senior managing director, Ascension Ventures, Clayton, Mo.

> Ensuring tight alignment between investment strategies with corporate goals
> Using syndication to partner with other strategic and financial investors
> Differentiating investing activities from operations to maintain investment discipline
> Integrating investments with operational and clinical activities to ensure they are relevant and connected
> Engaging top health system leadership in venture activities and investment decisions

In addition to these strategies, leading health systems implement venture management processes that avoid common pitfalls and maximize their ventures' chances of success.

Aligning Venture Investing Strategies with Corporate Goals

Venture investing by most health systems is strategically driven. Health systems look for "strategic payback" as well as financial payback to justify their investments. Key elements of an effective strategy for maximizing returns, according to the interviewed health system leaders, are collaborating with start-ups, helping them develop products, and using these products to create value in their organizations.

Health systems' experience with products and services they use makes them better investors. Despite its allure, however, venture financing is an unforgiving world. In the experience of one angel investing group, 30 percent of early-stage investments go out of business within two years, 30 percent survive and break even for investors, 30 percent survive eight to 10 years and provide a 2:1 to 3:1 payback, and only 10 percent or fewer create the 10:1 or greater paybacks the industry is known for. Given these odds, health systems must play to their strengths, including their expertise in the spaces they invest in, their ability to experiment and refine solutions, and their ability to scale investments rapidly.

Strategic investing is exemplified by the approach used by Providence Ventures (PV), a venture fund established by Renton, Wash.-based Providence St. Joseph Health (PSJH). The overarching goal of Aaron Martin, PSJH's executive vice president and chief digital officer and PV's managing general partner, is to integrate PSJH's digital strategy into its business strategy. PV focuses on "needle-moving problems" with high impact and high ROI, according to Martin, using what he calls a "technology cascade" to guide its investment strategy. The "technology cascade" is a series of questions PV uses to tailor its venture portfolio to PSJH's strategic goals:

> What are PSJH's strategic goals?
> Can its internal resources be configured to address each goal?
> If not, does PSJH have an available licensed technology that could be adapted to address the goal?
> If not, is a commercial solution already available in the market?
> If not, should PSJH build a solution to seize the unfilled opportunity and commercialize it?

Commercialization, Martin believes, is important to avoid creating orphan solutions.

Syndicating Venture Investments

Syndication, the process of attracting additional investors in a funding round, creates opportunities for health systems to invest in promising innovations and share in their success without taking undue risk. Syndication attracts capital and helps ventures grow. Financial co-investors provide capital, reduce financial risk, and help validate commercial potential by pressure-testing and honing growth plans. Strategic co-investors like other health systems help refine ventures' value propositions, offer alternative pilot sites (learning labs) for testing feasibility, and provide implementation sites for scaling up ventures once feasibility has been established.

Syndication is relevant to both "inside-out" and "outside-in" venture investing. Inside-out investors like the Cleveland Clinic must first decide whether to license the technologies they develop to other companies or to develop them into new start-ups. Peter O'Neill, executive director of CCI, puts it this way: "The complexities in developing a venture are significant, and we agonize over this. The important thing is getting products to patients, whether by licensing the technology or forming a new company." If the Cleveland Clinic's leaders decide their organization should develop the technology themselves, rather than license it, they usually syndicate ownership with other investors.

A number of collaboratives and private-equity firms have emerged to help health systems syndicate investments and build and manage their portfolios. Chicago-based AVIA is a member-owned innovation network that multiplies its impact through collaboration and scale.

"Our health system members are serious about investing in innovation," says Eric Langshur, CEO and cofounder. "AVIA's network model allows them to participate in 'advantaged investing,' where members curate ventures and facilitate co-investments, creating a knowledge-rich environment that inspires confident decisions."

Independent healthcare venture funds and diversified venture capital firms serve a similar function, linking health systems with other investors. The result is a complex web of

Venture Investing Strategic Considerations

Health system venture investors must address important strategic questions regarding investment focus, degree of risk, performance expectations, and the potential for revenue diversification.

Investment focus. Because of their mission, most health systems invest in ventures aimed at achieving Triple Aim goals: improving the patient experience, reducing the cost of care, and improving population health. Most health system venture groups steer away from investing in drugs, devices, and therapeutics because they cannot match independent investors' advantage in these areas. Many of the interviewed leaders share this perspective. Jeremy Porter, director of business development at Intermountain Healthcare (IHC) in Salt Lake City, says: "As a provider system, we're not going to add strategic value in these areas. We are focused mostly on innovations in care delivery."

Sam Brasch, senior managing director of Oakland, Calif.-based Kaiser Permanente (KP) Ventures, agrees, noting that KP Ventures gets greater "value-add" for its parent from innovations in IT and services than from purely clinical ventures such as pharmaceuticals and biomedical devices.

Degree of risk. In addition to deciding which areas to invest in, aligning strategic and investment goals requires thoughtful consideration of leadership's risk and liquidity preferences. Most mature health system venture groups, for example, avoid investing in early-stage start-ups. For example, according to Brasch, KP Ventures doesn't make Series A (i.e., first round) investments, preferring to invest in follow-on Series B or C rounds, which generally involve less risk. Although KP Ventures manages several large funds, it limits most investments to less than $10 million to manage its risk exposure.

Summation Health Ventures—a 50/50 joint venture between Los Angeles-based Cedars-Sinai and MemorialCare Health System—has a similar philosophy. Darren Dworkin, CIO of Cedars-Sinai and managing director of Summation, says: "We don't invest seed capital in early-stage start-up companies. We invest in companies that already have customers and have defined their market position. These companies have traction, are moving along, and want to grow and scale their operations in a manner where we can provide value."

Performance expectations. Health systems generally expect venture activities to earn a reasonable rate of return on their own, but because they also see strategic value in the companies they invest in, their ROI objectives are not necessarily as high as those of independent venture-capital and private-equity firms.

Michelle Conger, senior vice president and chief strategy officer of OSF HealthCare in Peoria, Ill., says that her system expects a 12 to 14 percent long-term ROI on its venture fund. She explains, "These returns are lower than independent venture firms' [returns], but that's because we intend to gain strategic value from the technologies we invest in, as these solutions are aimed at solving some of our most difficult problems."

Although "strategic payback" can certainly augment financial payback, setting ROI expectations lower than financial markets has the potential to protect mediocre ventures and misallocate capital. Older, more established venture organizations like KP Ventures, Ascension Ventures, and Cleveland Clinic Ventures are more likely to expect ventures to earn market return rates.

Revenue diversification. Traditionally, health systems did not look to venture investments to diversify their revenue base, mainly because the ventures were not large enough to be material. However, this pattern may be changing. UPMC Enterprises in Pittsburgh, for example, is committed to using ventures for revenue diversification, as exemplified by its development of the population health management (PHM) services company Evolent Health. Rasu Shrestha, MD, executive vice president of UPMC Enterprises, notes that Evolent Health emerged from UPMC Health Plan as a way to commercialize the plan's PHM expertise by supporting PHM startups for other systems.

Spinning out operations that are already delivering value is the quickest way to develop scale innovations that can contribute materially to revenue. However, scaling doesn't happen automatically; it often requires significant investment to reposition internal services for the broader external market. After proving Evolent's viability as a business, UPMC partnered with the Advisory Board Company in 2011 to capitalize and help market its services. In 2013, Evolent brought in Texas Pacific Group as a third investor to accelerate growth. The company went public in 2016 at a valuation of $1.2 billion, producing a 10:1 ROI for UPMC—a significant revenue-enhancer.

Another venture organization that is taking revenue enhancement seriously is the Innovation Institute, an LLC jointly owned by six not-for-profit health systems. Larry Stofko, executive vice president, reports that the Institute now has over $200 million in revenue from its shared services companies, and all of them are profitable.

syndicated ventures owned by multiple health systems and financial firms.

Differentiating Venture Investing From Operations

Health system venture investing requires a team of investment professionals, apart from line managers, who can objectively evaluate innovative technologies, nudge and cajole their champions to demonstrate value, decide how best to develop them, find investment partners, and provide the market and financial analysis needed to justify capital investment. These venture professionals are generally organized in venture organization units that are distinct from line operating units.

Venture units. The core organizing element of a venture unit is the venture team, the group of professionals responsible for moving the venture forward. The functions of venture teams evolve as ventures move through various stages of development, with team leaders often becoming board members when ventures are financed and syndicated. Syndication also creates opportunities to add investment professionals from independent healthcare venture funds and private capital firms.

Some health systems differentiate venture-investing units based on the type of ventures they manage. For example, Intermountain Healthcare (IHC) in Salt Lake City has three distinct venture units, according to Jeremy Porter, director of business development:

> An internal accelerator program, the Intermountain Foundry program, for funding and supporting early-stage internal ideas

> The Intermountain Innovation Fund, which funds and manages syndicated ventures

> A business development department that oversees these two activities (in partnership with Healthbox), spins out new companies, provides operational oversight of ongoing commercial activities within the health system, and works with companies with compelling products and services to pilot and help them mature within IHC.

Defined venture funds. Creating defined venture funds is another step in giving venture organizations independence from operations. Defined funds represent capital commitments from the corporation to the venture unit that serve several functions:

> Protecting venture investments from fluctuations in operating earnings

> Attracting high-quality investment professionals

> Facilitating co-investments with other venture firms

> Helping to maintain financial discipline (given these funds' orientation to achieving financial returns)

> Building capital and expertise to support larger investments

On the other hand, not all innovative health systems have defined venture funds. Cleveland Clinic Ventures, for example, has resisted creating a defined fund because management believes the fund structure imposes artificial financial constraints on their investments (e.g., the need to invest all the funds and liquidate investments in three to seven years). CCV's leaders believe funding ventures directly from the balance sheet gives the clinic greater flexibility. Of course, health systems that do not create defined funds can always define dedicated pools of capital that obviate the need to make separate funding requests for every venture.

Integrating Venture Activities With Operations

Although venture investing needs to be differentiated from operational and clinical activities, investment professionals cannot judge value effectively unless they have an intimate understanding of the health system's strategic goals and performance levers. In other words, differentiation of investing activities must be balanced with thoughtful integration of venture investments with operational and clinical activities. This is especially true if the health system's goals are strategic as well as financial—if it is trying to address operational or clinical issues in its own organization. Sam Brasch, senior managing director of Oakland, Calif.-based Kaiser Permanente (KP) Ventures, emphasizes the time and effort his unit spends understanding the strategic needs of Kaiser Permanente's clinicians and administrators.

Venture activities are also integrated with operations through pilots and demonstration projects aimed at establishing value. Running effective pilots is an art form: Although they are essential to testing and refining ventures, overdoing pilots can deplete resources, divert attention from building scale, and, in some cases, protect underperforming ventures.

P. Nelson Le, MD, medical director of AVIA, sums up the philosophy of Sacramento, Calif.-based Sutter Health in using rapid pilots to identify and fix problems, manage risk, and scale up innovations: "If you can't imagine scale, don't bother to pilot. Scale is the only way to create real system impact."[e]

The first test of any venture is usually whether one or more potential pilot sites can be convinced to spend time and attention piloting it. Constructing realistic pilots that provide legitimate validation of value requires careful planning and extensive monitoring. Pilots are fragile and can be easily undermined by extraneous events like budget cuts. Conversely, there is sometimes a tendency to keep pilots going longer than necessary, especially when the decision should be to "cut the cord" and abandon an underperforming venture.

Elements of an Effective Venture Development Process

> Sourcing diverse deals from multiple channels
> Involving line managers in venture selection
> Applying a defined vetting process that includes:
  • Validation by customers/users
  • Evaluation of IT systems integration (a weak point in a complex ecosystem)
  • Reviews with internal and external constituents
> Forming a management team as early as possible
> Planning workflow integration
> Running effective pilot(s) and addressing pain points
> Planning product roll-out and distribution
> Promoting growth, internally as well as externally
> Managing key development transitions (e.g., capitalization, syndication)

Engaging Leadership

Most health system venture units report to senior levels of their organizations to ensure they have visibility and engagement from top management. In addition to providing top-level support for venture investing, senior managers often contribute important ideas that can change a venture's trajectory. And occasionally, the intuition of top leaders has rescued valuable ventures from the scrap heap.

If venture units do not report to senior management, another means of achieving high-level visibility is through a high-level venture-management committee. KP Ventures reports quarterly to a venture fund management committee, co-chaired by two of the most senior executives in the corporation: the executive vice president of Health Plan Operations for Kaiser Foundation Health Plan and Kaiser Foundation Hospitals, and the executive vice president, finance and strategy, of The Permanente Federation, who is also medical director, business management, of the Southern California Permanente Medical Group.

At Peoria, Ill.-based OSF HealthCare, the commitment to venture investing was championed by the health system's CEO, according to Michelle Conger, senior vice president and chief strategy officer at OSF. Since it was founded three years ago, the organization's $75 million fund has made nine investments and become a limited partner in Ascension Ventures Fund IV. The performance of each investment is monitored quarterly by a committee that includes the system's CEO, CFO, president, Conger, and several members of the board investment committee.

e. Le, P.N., "Sutter Health's Approach to Innovation and Physician Burnout," *Becker's Health IT and CIO Review*, Dec. 20, 2016.

Case Example: The Innovation Institute and Its Enterprise Development Groups

The Innovation Institute is a collaborative established with the strategic intent of focusing on innovation and growth. Its strategic purpose is to advance innovation and find new revenue sources. It was launched in January 2013 as a for-profit LLC. At the core, the Innovation Institute is an incubator established to tap into clinicians on the front line to find new ways to advance care delivery through the commercialization of new ideas with products including medical devices, diagnostics, digital health, sensors, and other platforms. The Innovation Institute is owned by six not-for-profit health systems—Franciscan Missionaries of Our Lady Health System, East Baton Rouge Parish, La.; Bon Secours Health System, Mariottsville, Md.; Avera Health, Sioux Falls, S.D.; Providence St. Joseph Health, Renton, Wash.; Children's Hospital of Orange County, Orange, Calif.; and Mercy Health of Cincinnati. The minimum investment to be an investor or "Member Owner" is 10 million. Currently the Innovation Institute is in discussion with two additional health systems about joining the collaborative.

"The Institute's signature program is the Innovation Lab, or the 'incubator,' says Larry Stofko, executive vice president of the Innovation Lab. "To date, the Lab has received more than 1,900 invention disclosures and has 239 products currently in evaluation or product development." Most of the exits for the products are through license agreements. In addition to the incubator, the Innovation Institute is a general partner in a 10-year $100 million fund through a partnership with LRVHealth. As the incubator focuses on nascent ideas coming from the member health systems, the fund will focus on investing in early-stage companies that are looking for growth capital.

The Innovation Institute also has recently added a crowd-funding platform through a partnership with Red Crow Crowd Funding, which will allow the lab to help entrepreneurs get start-up capital to assist with getting their products to market. The Innovation Institute is set up to work with inventors and entrepreneurs with ideas and products at any stage along the continuum.

"There was a lot of research done before the Innovation Institute was launched, says Joe Randolph, president and CEO of the Innovation Institute. "After a review of what other innovation groups across the country were doing, some key principals went into the formation of the business model." Randolph notes that it was important that the model be self-sustaining and profitable, have a nimble governance structure, be a collaborative that would bring like-minded organizations together, and be focused on the long-term. It was determined that, to reflect these principles, the Innovation Institute needed to be operated independently and not be controlled by a health system.

Randolph also notes, "We did not want it to operate like a venture fund or capital group that had to take a short-term view on investment decisions, so we set up a unique business model that provided immediate cash flow to fund the innovation activities,"

The Innovation Institute has been profitable almost since its launch. The cash flow to fund the Institute comes from a shared services model of portfolio companies. "These companies are not focused on innovation," Randolph says. "They are the economic engine that funds the innovation activities."

There are about 15 companies, and each one is a separate limited liability company. The companies are part of what the Innovation Institute calls the Enterprise Development Group (EDG). They provide services that are often outsourced, such as medical record coding, staffing, construction management, people strategies, recruitment, executive coaching, bio-medical engineering services, construction, equipment brokerage, furniture, real estate brokerage, and property management. The Innovation Institute does not get involved with any direct patient care areas.

The Institute also owns a healthcare real estate fund that partners with health systems looking to monetize real estate assets or looking for a friendly partner to acquire strategic properties.

There is no requirement that the member health systems use the EDG services. "We have to win the business based upon price and quality," Randolph says. "More than half of our revenues ($202 million in total revenue last year) came from outside of our Member Systems. We own controlling interest in each of the portfolio companies."

In the first five years, the cash flows generated by the Innovation Institute have been reinvested to grow the model and establish a steady state. Beginning in the sixth year, the Innovation Institute plans to pay dividends to the health system member owners.

The Innovation Institute model provides a platform for advancing innovation while providing an immediate ROI for its health system members, due to the unique business model. The Institute has experienced significant growth in its first five years, and anticipates similar growth in five years to come.

Executing Effective Venture Development Processes

Successful venture development requires managing a complex set of processes timely and effectively. The sidebar on page 7 lists elements of an effective venture development process.

Different health systems use different vetting processes, but most have multiple layers of review. At the Cleveland Clinic, innovations are reviewed first by peer review committees, then by one of three advisory councils (health IT, devices, and diagnostics and therapeutics), which include outside investors, and finally by the Cleveland Clinic Commercialization Council.

Filling critical venture roles. Forming the venture management team is a critical step in managing ventures. Dave Tamburri, managing director of Health Enterprise Partners in New York, cites "strength of management" as being one of the three most important due diligence items for venture investing.[f]

Within the venture team, the most critical role is the venture champion, owner, or leader—the person who stakes his or her reputation on the success of the venture. Without a capable, committed champion, ventures have little chance of success. UPMC Enterprises has built a stable of "entrepreneurs-in-residence" to lead new ventures. And Ascension Ventures in Clayton, Mo., uses psychometric testing to identify potential entrepreneurs, which has the effect of "shortening the trust cycle" with its management teams, according to Matt Hermann, senior managing director.

Other venture team roles are also important. Executive sponsors can be important to venture success, especially for ventures that aren't protected by a defined fund and/or co-investors. And it is important to have a venture team of experienced investment professionals who can act as translators, bridge-builders, collaborators, conveners, and project managers.

Managing transitions and uncertainty. Managing key transitions in the venture development process is a critical skill. Jack Miner of CCV emphasizes keeping the exit in mind whenever a venture hits a decision point: "The worst thing you can do is get excited about something without any concept of where it is going to end up."

Although the processes shown in the above sidebar provide good direction, the venture development process is inherently uncertain and must be flexible. "The timing of strategic and investment goals doesn't always line up," according to Porter of IHC: "You can't always wait until you get all the customer input you might want. You need to get clinical and financial inputs, but then you need to make investment decisions quickly and efficiently."

Venture Investing Traps

Interviews with health system leaders also disclosed some venture investing traps that less-experienced investors sometimes fall into. Most mature venture funds avoid early-stage investments, and they make a point of investing in things they use internally. Less-experienced investors that do not adopt these approaches may deprive their investments of two main points of comparative advantage: the ability to validate efficacy and impact, and the ability to help the validated venture scale up to achieve critical mass.

Trying to apply non-healthcare solutions to health care is another trap, says Brasch of KP Ventures. He notes that KP Ventures avoids investing in companies that are trying to migrate technologies proven in other industries into health care. The U.S. health sector has created such a distinct set of requirements that non-healthcare players—no matter how innovative—will always be challenged to apply their concepts to the sector.

f. The other two important due diligence items, according to Tamburri, are getting the market timing right and making sure the venture is following a good trend line and has the ability to capture market share.

The Cleveland Clinic's Culture of Innovation

The Cleveland Clinic is well known as one of the world's most innovative health systems. Founded by a group of surgeons in 1921, the Clinic started by focusing on surgical innovations. To date, its list of important surgical and interventional innovations includes coronary angiography, lumpectomies for breast cancer patients, minimally invasive aortic valve surgery, transcatheter valve replacement and repair, larynx and near-total face transplants, and the early development and refinement of coronary bypass surgery. Over the past 15-20 years, however, the scope of the Clinic's innovations has broadened considerably, encompassing medical devices, therapeutics and diagnostics, health IT, and care delivery solutions such as the data-mining firm Explorys, which the Clinic sold to IBM Watson Health in 2015.

Like other world-famous centers of medical innovation, the foundation of the Clinic's innovative culture is the quality of the physicians and researchers it attracts and the expectation for innovation it inculcates in these talented professionals. As Pete O'Neill, executive director of Cleveland Clinic Innovations (CCI), says, "Our doctors believe that when they've worked with a patient, they've helped one patient, but if they innovate, they can potentially help thousands."

There is a subtle difference between expectations for innovation at the Clinic and what you might find at main-line academic centers like Yale, Harvard, or the University of California, San Francisco. For example, although publications are important, they are not the end goal. It is more important that the innovations work, are used, and save lives. CCI's web site lists innovations developed by Clinic inventors, summarizing the following for each invention:

> The inventor or inventors
> What the innovation is and what it does
> Why it is better than alternatives
> Its current status (e.g., "in pilot testing," "patent pending," or "in use throughout the Clinic")

Cleveland Clinic Ventures (CCV), the Clinic's venture investment arm (and, until 2018, part of CCI), manages a portfolio of 35 to 40 companies. Jack Miner, CCV's managing director, is instilling the disciplines of a Tier 1 fund manager in CCV, where investment professionals track progress of their companies to make sure they are achieving their milestones. If a company is doing so, it reserves capital for future financing rounds. If is not achieving its targets, it seeks means for assistance, often asking the advice of Cleveland Clinic physicians.

Over the past few years, the Clinic has made a major corporate commitment to building its population health management capabilities by creating a separate business unit dedicated to managing populations. This change has opened up many new areas for potential innovation. As Ann Huston, the Clinic's chief strategy officer explains: "There are many unknowns. We're not sure what needs to be connected or how. How do we connect nutritionists with physicians? What is the provenance of population health data? How reliable is it? How do we get it into the electronic health record?"

Questions like these will exercise the Clinic's culture of innovation over the next decade.

Over-reaching can also be a trap. The number of new ventures any health system can successfully evaluate, facilitate, and bring to market depends on the number of qualified champions and investment professionals available to the venture group, and the amount of attention the ventures can command from senior managers. Richard Roth, chief strategic innovation officer for San Francisco-based Dignity Health, notes that his organization targets three to five new investments per year and has successfully exited at least one per year over several years. Potentially serious consequences from over-reaching include delayed launches, write-offs, reduced returns, and loss of confidence among senior managers in the venture enterprise.

Using Venture Investing to Spur Innovation

Venture investing is a potential game-changer for health systems if it can spur innovation in their business and operating models. In one report, industry experts advocate balancing corporate investment portfolios among incremental investments to existing businesses (50 percent), logical extensions of the core business (30 percent), and new growth initiatives (20 percent).[g]

g. Anthony, S.D., Johnson, M.W., Sinfield, J.V., "Institutionalizing Innovation," *MIT Sloan Management Review,* Jan. 1, 2008.

Most health systems allocate the vast majority of management time and capital to keeping the trains running. Although health systems are filled with innovative technologies, most of these are developed by pharmaceutical companies, device companies, equipment manufactures, and the like. Except for the "inside-out" companies described previously, innovations that originate in health systems typically are incremental, often driven by individual physicians with new approaches to care delivery.

Increasingly, however, health systems are using venture investments to stimulate innovation. A recent blog post describes NYP Ventures' development of NYP OnDemand, the health system's telemedicine program, as an "innovation stack" of six core tasks:[h]

> Clarifying the problem to be solved and developing appropriate use cases
> Researching solutions with potential users in their own and other organizations, with government regulators, etc.
> Identifying best-of-breed vendors through a rapid evaluation process
> Implementing solutions based on use cases that balance need and speed to execution
> Scaling through partnerships to broaden the reach and capabilities of the venture
> Making investments in core technologies to help refine product offerings and capture more of the upside benefit from the innovation

NYP is committed to using NYP OnDemand to transform their organization by delivering 100,000 telehealth visits by the end of 2018. This commitment shows the intimate connection between venture investing and organizational transformation. Committing to aggressive implementation plans engages operational leaders in the venture and reinforces and energizes the venture team's efforts.

Venture investing can help health systems nurture cultural values of innovation and entrepreneurship in the following ways.

Changing leadership mindsets. Rasu Shrestha, MD, executive vice president of Pittsburgh-based UPMC Enterprises, emphasizes the need for a high tolerance for risk and a long runway to develop successful ventures. Venture investing programs can help health systems build a "transient advantage" that can deliver returns on a shorter time frame than long-term investments in bricks and mortar and in staff, and leaders who adopt this mindset will be much more supportive of innovative endeavors throughout the organization.[i]

Creating incentives to innovate. Companies with strong venture programs have experience in creating and applying innovation incentives within their organizations. By rewarding venture successes and making innovators heroes, organizations can inspire others to take on riskier projects and free up the organization to try more new things.

Building innovation skills. Venture investing builds key skills required for innovation such as business planning, entrepreneurship, communications, influence, and teamwork, as well as personal qualities like persistence and resilience. Companies that build these skills can't help but become more innovative.

Providing symbolic reinforcement. Venture investing can reinforce the importance of innovation across the organization, especially when combined with other initiatives. Most of the health systems surveyed in this report have made highly visible commitments to encouraging innovation on and off their campuses. Johns Hopkins, for example, has two separate organizations aimed at commercializing internal innovations developed by their researchers and clinicians:

h. J. Gordon, J., Fleischut, P., Tsay, D., Coyne, S., Barchi, D., and Deland, E., "How NYP Used Its Innovation Stack to Launch a Telehealth Program," *NEJM Catalyst*, July 10, 2017,

i. McGrath, R.G., "Transient Advantage," *Harvard Business Review*, June 2013.

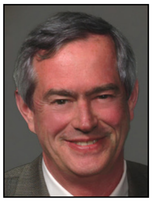
- > Johns Hopkins Healthcare Solutions, which sells services to health plans and large employers
- > Johns Hopkins Technology Ventures (JHTV), which employs more than 100 people and offers a variety of programs to encourage and support innovation across the university (not just in health care)

Attracting innovators. Health systems with active venture-investing programs naturally attract people who have the desire and skills to be innovators. In this way, innovation becomes self-reinforcing.

Researchers have identified many factors responsible for the high cost and mixed performance of our health sector, relative to other advanced economies.[j] Whatever the causes, transforming our health systems into more flexible, innovative companies that can allocate capital more efficiently to meet the needs of consumers and patients has great potential to improve the price-performance of the sector. Properly structured and managed, venture investing by health systems can play an important role in revitalizing U.S. health care. ■

j. Ginsburg, P., et al., *What Is Driving U.S. Health Care Spending? America's Unsustainable Health Care Cost Growth*, Washington: Bipartisan Policy Center, September 2012.

About the authors



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APPENDIX 1

ORGANIZATIONS AND EXECUTIVES INTERVIEWED FOR BDC ADVISORS' ANNUAL SURVEYS OF VENTURE INVESTING, 2016 AND 2017			
Organization	**Interviewee/Title***	**Interviewed 2016**	**Interviewed 2017**
Ascension Health	Johnny Smith, Senior Director of Public Relations	X	
Ascension Ventures	Matt Hermann, Senior Managing Director	X	X
AVIA	Eric Langshur, Cofounder and CEO		X
Blue Shield of California	Paul Markovich, President and CEO	X	
Brigham and Women's Hospital	Lesley Solomon, Brigham Research Institute Strategy and Innovation Director	X	
	Haley Bridger, Senior Science Communication Specialist	X	
Carolinas Healthcare System Strategic Fund	Tye Nordberg, Managing Partner	X	
Catholic Health Initiatives	Michael Rowan, President of Health System Delivery and COO	X	
Cedars-Sinai Medical Center	Darren Dworkin, CIO		X
Cleveland Clinic	Ann Huston, Chief Strategy Officer		X
	Peter O'Neill, Executive Director, CC Innovations		X
	Jack Miner, Managing Director, CC Ventures		X
Coca Cola	Anthony Newstead, Program Lead for The Bridge	X	
Digital Health Innovation Lab	Sarah Jane Militello, Director of Operations	X	
Dignity Health	Richard Roth, Vice President of Strategic Innovation	X	X
Geisinger Ventures	Jim Peters, Senior Vice President and Managing Partner	X	
Health Enterprise Partners	Dave Tamburri, Managing Director	X	X
	Ezra Mehlman, Principal	X	
HealthBox	Nina Nashif, CEO and Founder	X	
	Neil Patel, President		X
	Jeffrey Ries, Vice President of Fund Management	X	X
The Innovation Institute	Larry Stofko, Executive Vice President and Chief Technology Officer		X
Intermountain Health Care	Nickolas Mark, Director, Business Development	X	
	Jeremy Porter, Director, Intermountain Innovations	X	X
Johns Hopkins Healthcare Solutions	Mark Cochran, Executive Director	X	X
KP Ventures	Sam Brasch, Senior Managing Director		X
Mayo Clinic Ventures	James Rogers III, Chair	X	X
McKesson Ventures	David Schulte, Managing Director	X	
	Megan Fuente, Office Manager	X	
NYP Ventures	Jonathan Gordon, Director		X
Oak Hill Capital	Mark Pacala, Senior Advisor	X	
Ochsner Health System	Giselle Hecker, Director of Public Relations	X	
OSF Healthcare System	Michelle Conger, Chief Strategy Officer		X
Partners Innovation Fund	Roger Kitterman, Vice President of Venture and Managing Partner	X	
Providence St. Joseph Health	Aaron Martin, Chief Digital Officer and Managing General Partner, Providence Ventures	X	X
	Sara Vaezy, Chief Digital Strategy Officer		X
	Ashley Wilson, Senior Manager of External Relations	X	
University of Chicago	Nancy Harvey, Managing Director, The Polsky Center for Entrepreneurship & Innovation		X
UPMC Enterprises	Rasu Shreshtha, MD, Chief Innovation Officer		X
	Wendy Zellner, Senior Director of Public Relations		X
Venture Valkyrie	Lisa Suennen, Cofounder	X	X

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APPENDIX 2

HEALTH SYSTEM VENTURE FUNDS (PARTIAL LIST)			
Health System	**Has Its Own Fund**	**Invests in Other Funds**	**Additional Funds in Which Health System Is Investing**
Adventist Health System, Altamonte, Fla.		Yes	Ascension Ventures, Heritage Group
Advocate Health Care, Downers Grove, Ill.		Yes	Healthbox
Allina Health, Minneapolis		Yes	Health Enterprise Partners
Ascension, St. Louis	Yes	Yes	Healthbox
Aurora Health Care, Milwaukee		Yes	Startup Health
BayCare Health System, Clearwater, Fla.	Yes	Yes	Avia
Baylor Scott & White Health, Dallas		Yes	Healthbox
BJC HealthCare, St. Louis	Yes		
Boston Children's Hospital, Boston		Yes	Rock Health
Catholic Health East (now Trinity Health), Livonia, Mich.		Yes	Ascension Ventures
Cedars-Sinai, Los Angeles		Yes	Summation Health Ventures
Catholic Health Initiatives, Englewood, Colo.		Yes	Ascension Ventures
Christiana Care Health System, Wilmington, Del.	Yes	Yes	Avia
CHS, Franklin, Tenn.		Yes	Heritage Group
Cincinnati's Children's Hospital Medical Center, Cincinnati	Yes		
Cleveland Clinic, Cleveland	Yes	Yes	Flare Capital Partners, Health Enterprise Partners
Community Hospital of the Monterey Peninsula, Moneterey, Calif.		Yes	Health Enterprise Partners
Dignity Health, San Francisco	Yes	Yes	Ascension Ventures, Avia
Edward-Elmhurst Healthcare, Elmhurst, Ill.		Yes	Healthbox
Froedert & Medical College of Wisconsin, Milwaukee	Yes	Yes	Avia
Geisinger Health System, Danville, Penn.	Yes		
Greenville Health System, Greenville, S.C.	Yes	Yes	Avia
HCA, Nashville, Tenn.		Yes	Healthbox, Health Insight Capital
Henry Mayo Newhall Hospital, Valencia, Calif.		Yes	Healthbox
Inova Health System, Falls Church, Va.	Yes		
Intermountain Healthcare, Salt Lake City	Yes	Yes	Ascension Ventures, Healthbox, Heritage Group
IU Health, Indianapolis		Yes	CHV Capital
Jefferson Health, Philadelphia	Yes		
Kaiser Permanente, Oakland, Calif.	Yes	Yes	KP Ventures, Rock Health, Startup Health
Kettering Health Network, Dayton, Ohio		Yes	Health Enterprise Partners
LifePoint Health, Brentwood, Tenn.		Yes	Heritage Group
Mayo Clinic, Rochester, Minn.	Yes		
MD Anderson, Houston	Yes	Yes	Avia, Strategy Industry Ventures
Memorial Hermann	Yes	Yes	Avia, Heritage Group
MemorialCare Health System, Houston	Yes	Yes	Health Enterprise Partners, Summation Health Ventures
Mercy Health, Chesterfield, Mo.	Yes	Yes	Ascension Ventures, Avia

APPENDIX 2 (CONTINUED)

Health System	Has Its Own Fund	Invests in Other Funds	Additional Funds in Which Health System Is Investing
Miami Children's Health System, Miami	Yes		
Mount Sinai Health System, New York	Yes		
Navicent Health, Macon, Ga.	Yes	Yes	Avia
NewYork-Presbyterian Hospital, New York	Yes		
Northwestern Medicine, Chicago	Yes	Yes	Avia
Ochsner Medical Center, Jefferson, La.	Yes		
OSF HealthCare, Peoria, Ill.	Yes	Yes	Ascension Ventures, Avia
Partners HealthCare, Boston	Yes		
Palmetto Health, Columbia, S.C.	Yes	Yes	Avia
Penn Medicine, Philadelphia	Yes		
Piedmont Healthcare, Atlanta	Yes	Yes	Avia
Presbyterian, Albuquerque	Yes	Yes	Avia
Providence St. Joseph Health, Renton, Wash.	Yes	Yes	Avia
Rush University Medical Center, Chicago	Yes	Yes	Avia, Healthbox
Sanford Health, Sioux Falls, S.D.		Yes	Health Enterprise Partners
Sentara Healthcare, Norfolk, Va.		Yes	Health Enterprise Partners
Shannon Medical Center		Yes	Health Enterprise Partners
Sinai Health System, Chicago	Yes	Yes	Avia
Spectrum Health, Grand Rapids, Mich.	Yes	Yes	Avia
St. Luke's University Health Network, Bethlehem, Pa.	Yes	Yes	Avia
St. Vincent Healthcare, Billings, Mont.		Yes	Healthbox
Stanford Health Care, Stanford, Calif.	Yes		
Sutter Health, Sacramento, Calif.	Yes	Yes	Avia, Health Enterprise Partners, Heritage Group, Rock Health
Tenet Health, Dallas		Yes	Heritage Group
Trinity Health, Livonia, Mich.	Yes	Yes	Ascension Ventures, Heritage Group, Avia
UCLA Health, Los Angeles		Yes	Healthbox
UNC Health Care, Chapel Hill, N.C.		Yes	Rex Health Ventures
UnityPoint Health, West Des Moines, Iowa		Yes	Heritage Group
University Hospitals Case Medical Center, Cleveland	Yes		
University of Chicago Medicine, Chicago	Yes		
University of Kansas Health System, Kansas City, Kansas	Yes	Yes	Avia
UPMC, Pittsburgh	Yes		
Keck Medicine of USC, Los Angeles		Yes	Healthbox

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