information edge

September 2006
Volume 12, Number 8

Show Me the Money

EXECUTIVE SUMMARY

Documenting cash reductions or new revenue from IT investments is sometimes like counting angels on the head of a pin. It's too often a matter of faith. Still, during the past two decades or more we've seen healthcare IT go from being fancy cash registers for hospitals counting fee-for-service payments to complex, clinically-based systems considered crown jewels of the enterprise. In the course of things, IT has become a critical component of hospitals' and health systems' strategic plans.

But even as healthcare CIOs have moved into the executive suite and CEOs have finally "gotten it" in terms of the IT imperative during this evolution, documented returns for IT in healthcare have proven elusive. The business case for IT in healthcare is still equal parts faith, art and science. However, the science part is growing as the newest systems for patient flow, revenue cycle and PACS are beginning to "rationalize" the business and produce results in terms of improved capacity and throughput, improved collections and elimination of wasteful processes.

These may be discrete systems but they are not islands. While they represent different applications, part of their effectiveness lies in their integration throughout the enterprise. Even PACS, for example, has broken free of its radiology-department walls and become available to community physicians and radiologists alike. In this issue of Information Edge we revisit the issue of whether IT can drive cash returns and who if anyone has documented it. The truth is we're in a transition stage. While the bulk of clinical applications like CPOE are organizational imperatives, they lack measurable hard dollar returns today. At the same time, most IT proposals include a projected return on investment as part of the business case demanded by boards. Then there are organizations that are leading the way in measuring the return on IT. Out of necessity we blended a bit of all three in order to present a snapshot of today's environment.

IT-enabled elbow room

If it's true that if you succeed in New York, you can succeed anywhere, then healthcare systems nationwide can look forward to using IT to enable major capital investment. In the late 1990s, when Memorial Sloane Kettering Cancer Center in New York needed to expand, it found itself blocked by existing neighbors. However, strategic use of IT made it possible to expand elsewhere in Manhattan while maintaining the seamless integration of a single facility.

SCOTTSDALE INSTITUTE

Membership Services Office:
1660 Highway 100 South
Suite 306
Minneapolis, MN 55416
T. 952.545.5880
F. 952.545.6116
E. scottsdale@scottsdaleinstitute.org
W. scottsdaleinstitute.org

For information on any of these teleconferences, please register on our Website scottsdaleinstitute.org

October 10
KLAS on PACS/RIS
- Jeremy Bikman, director, Medical Equipment, KLAS Enterprises, Orem, Utah

October 12
Adoption to Optimization to Mandate: The Allina Journey
- Kim Pederson, EVP, Project Excellian, Allina Hospitals and Clinics, Minneapolis

October 17
Cardiovascular Information Systems (CVIS): An Overview (part 1)
- Ian Temple, RN, MBA, manager, Integrated Digital Enterprise and Solutions (IDEAS), First Consulting Group, Long Beach, Calif.

October 18
Centura Health: Addressing Connectivity for Private Practice Physicians' Disparate EMR systems; Why Portal Access is not Sufficient
- Michael Shrift, MD, MBA, CMIO, Centura Health, Englewood, Colo.
- Michael Mignoli, MD, Denver

October 24
Enterprise Clinical Imaging Management Strategies
- Lou Ciraldo, division information officer, University Hospitals of Cleveland
- Vincent Norlock, consulting manager, FCG, Long Beach, Calif.

more events on next page

"Technology allowed us to grow," says Pat Skarulis, VP and CIO at Memorial Sloan Kettering Cancer Center. "We were out of space and couldn't grow because we were landlocked." Instead the cancer center had to go 15 blocks away to where a new Marriott hotel was being built, taking the first 13 floors of the new building for outpatient space. Cancer patients enter on the ground level to the feel of a small building with a cascading waterfall.

"We couldn't have doctors ferrying medical records back and forth. We had to have clinical information like orders and results available immediately 15 blocks from the main facility to ensure specific tests and treatments were done. We have highly specialized radiology. In one fell swoop we went paperless and filmless with all orders electronic," she says.

"It wouldn't have been possible to expand to the new facility if we hadn't made that IT investment," says Skarulis, who estimates its cost in the millions of dollars as part of the facility's building budget. That includes an Eclipsys core clinical IS and a GE PACS. All paper medical records have been scanned into the system. "All of our records are run off a single database for both inpatient and outpatient."

Skarulis says Memorial Sloan Kettering considered the Manhattan outpatient clinic so successful that it became the model for other clinics since built in New Jersey and Long Island. "We're replicating the system, now are able to grow much farther from the hospital. Jitney buses run every 20 minutes to ferry physicians between the main facility and the outpatient clinics. A doctor, for example, might have a clinic on a Tuesday afternoon, and then in the afternoon do follow-up."

Cedars Sinai L.A.

While IT may have created a capital-expansion opportunity for Memorial Sloane Kettering, on the other side of the continent, a clinical IT expert says the benefits from most IT initiatives are not so clear cut.

Robert Jenders, MD, clinical informaticist, Cedars-Sinai Health System, Los Angeles

"There's a sense in the informatics community that IT can lead to improved revenues and reduced expenditures," says Robert A. Jenders, MD, a clinical informaticist in the enterprise information services department at Cedars-Sinai Health System in Los Angeles and an associate professor of medicine at UCLA Medical School. He cites recent articles such as the July issue of Health Affairs, which addresses IT's cost benefits, but ultimately concludes there's nothing proven in a strict dollar sense.

There certainly are returns, Jenders says, including reduced medication errors and LOS from complications, but in terms of published data supporting cash generated from IT, "the answer is no."

The May issue of The Annals of Internal Medicine reviewed the literature on the subject and came to the same conclusion. Jenders says it's become common for strate-

gic plans to include savings estimates from proposed implementations of systems such as surgical IS—an initiative Cedars currently has underway. Those include potential savings like decreased downtime between cases, increased patient flow and associated capacity. "You can do more cases per unit time if you manage the flow of patients and the availability of professional time. All that can enhance the revenue of an organization," he says.

Still, notes Jenders, "Other industries have made a better case for use of IT, partly because of the complexity of healthcare enterprise and partly from the assignment of cost in healthcare. There's a well-cited mis-alignment of costs and benefits in healthcare." An entity may reap benefits from the availability of data and reporting compliance, but the cost is borne by the physicians who previously dictated their reports but now must take extra time to type them.

"The question is to whom do the benefits accrue? Healthcare organizations and the government recognize the benefits to them, but practitioners see only the cost, whether associated with maintenance of the system or reorganization of workflow," says Jenders, adding that's why there's such a low EHR adoption rate—20% to 25%—among physician offices.

Some studies show significant non-financial benefits from IT such as improved quality of life for both practitioners and patients. "That forms a significant case: The fact a practitioner can spend less time chasing down paper information."

Jender says cost-benefit analysis is part of Cedars' strategic plan for an integrated clinical IS—order entry, physician/nurse documentation, results review—but not all the benefits are monetary, especially with an organization like Cedars that lists compliance with clinical guidelines, regulatory requirements and standards like HL7 as top priorities.

CFOs on board

Despite the ambiguity associated with ROI, CFOs back IT as an integral part of business success. "Most financial executives are committed to investing more in IT," says Rick Gundling, Washington, DC-based VP at the Healthcare Financial Management Association (HFMA). "Healthcare IT is a top priority. Healthcare financial managers look at IT as strategically the right thing to do," he says. Gundling acknowledges that CFOs tend to underestimate the cost of training associated with IT-enabled process change.

Rick Gundling, VP, HFMA, Washington, DC

To help CFOs and other financial executives understand the return from IT, HFMA and Cerner co-sponsored a roundtable discussion called "EHR Investments: The Value Case for Senior Healthcare Executives" last year. The discussion was introduced with a hypothetical exchange in which a CFO asks a board member to support a major IT investment. When the board member asks what savings can be expected, the CFO's response is, "Well, I can't say for certain."

The point: the CFO must face up to the need for IT initiatives despite the fuzziness of

Upcoming Events continued

October 26
Medication Reconciliation at Advocate Healthcare
- Joel S. Shoolin, DO, MBA, VP clinical informatics, Advocate Healthcare, Chicago
- Margie Hunnsinger, RN, mgr. clinical analysts, CareConnection, Advocate Healthcare, Chicago
- Steven Sundberg, RPh, Pharmacy Direction, Advocate Lutheran General Hospital, Park Ridge, Ill.
- Paul Cook, Riverpoint Consulting, Chicago

October 31
Medication Reconciliation at UMassMemorial
- Eric Alper, M.D. former Patient Safety Officer, UMass Memorial Medical Center, Worchester, Mass.

November 7
Cardiovascular Information Systems (CVIS): Implementing CVIS (Part 2)
- Ian Temple, RN, MBA, manger, Integrated Digital Enterprise and Solutions (IDEAS), FCG, Long Beach, Calif.

November 15
Disease Management Results at Partners Healthcare
- Timothy G. Ferris, MD, MPH, senior scientist, Mass General Hospital's Institute for Health Policy and Director of Disease Management Programs, Partners Healthcare, Boston

For information on any of these teleconferences, please register on our Website scottsdaleinstitute.org

financial returns from IT, because pay-for-performance programs, federally mandated e-prescribing and interoperability standards, and consumer-directed healthcare are all conspiring to drive IT investments. "These directives for transparency make it strategically imperative for providers to adopt better tracking and reporting technologies," says the report.

While the roundtable concludes that financial managers must make "the business case for an EHR—both from a financial and strategic perspective…," it acknowledges that "an even greater barrier to EHR adoption than the hefty price tag appears to be the difficulty in quantifying an associated level of return. Many senior healthcare financial executives find it extremely challenging to build a definitive business case based on cost savings."

Trinity Health

So, how does a CFO build a business case? In the HFMA roundtable, James Peppiatt-Combs, CFO at Trinity Health in Novi, Mich., described the organization's experience in its $200-million, comprehensive information system initiative linking clinical, revenue cycle and supply-chain management functions via a common EHR. No small task, considering Trinity Health is one of the largest Catholic healthcare systems in the country, owning 23 hospitals and operating a total of 45.

TRINITY HEALTH

When local sites developed business cases for the initiative, they were able to identify hard savings in the ROI analysis, but actual overall costs sometimes went up once the IT was introduced. In other cases, as processes were reengineered, efficiencies were realized before the IT was actually implemented. Finally, even when savings were calculated they amounted to a relatively small 6.5%, typically not enough to justify the investment.

Given the difficulty of nailing down hard dollar figures, Trinity Health ended up determining ROI by carefully selecting discrete measures, analyzing them in limited use and then extrapolating the benefits to larger implementations. The key turned out to be establishing a baseline at the beginning of the process while allowing enough flexibility for it to change as the implementation was completed.

Trinity Health cited some familiar areas as amenable to improved margins from IT: reductions in transcription costs; savings in paper-chart-related costs (supplies, copying, printing and storage); improved staff efficiency from less time spent searching for charts and manually entering charges; and revenue enhancements for better coding and charge-entry. Other cost-cutting came from reducing length of stay and medical errors by integrating clinical standards and evidence-based protocols into order-entry systems.

The HFMA roundtable concluded: "The prospect of a safer and more efficient environment where patients want to go and physicians want to practice—the soft side of ROI—is where the heart of most business cases will lie. The most convincing business cases typically blend a discussion of return in terms of a best approximation of specific, measurable results with ways in which the technology is likely to affect overall

Trinity Health ended up determining ROI by carefully selecting discrete measures, analyzing them in limited use and then extrapolating the benefits to larger implementations. The key turned out to be establishing a baseline at the beginning of the process while allowing enough flexibility for it to change as the implementation was completed.

quality of care delivery…In the end, it's not hard dollars so much as strategic significance that will guide most business cases for EHR adoption. Rather than focusing on costs associated with acquiring the technology, discussions begin to center on opportunity costs associated with postponing investment."

Alignment at Allina

Despite the challenges, leading provider organizations are developing more disciplined ways of measuring benefits realization.

Allina Hospitals & Clinics in Minneapolis/St. Paul may be the only hospital system in the country to implement 900 clinical order sets across its entire system of 11 hospitals to reduce costs and variation—and to measure the results. Sharon Henry, RN, director for clinical decision support, estimates that between 2002 and 2005 the organization has saved $1.7 million based on cost accounting for 43 DRGs. While that figure is likely to shrink as final cost data come in, still, she says, "We see a trend down."

The data is not physician-specific but is case-type or DRG-specific (pneumonia for example). "We're able to incorporate standard order sets. Our seven-analyst team conducts research for best evidence," she notes, which can be incorporated into the clinical IS. The analysts develop straw models for presentation to case-type experts who then can arrive at a consensus, sometimes within two hours.

"It's a lot of up-front work" by the clinical decision-support team—all RNs with specialty backgrounds—to produce the models for the more than 50 groups of clinical experts who review them, says Henry. "It's a pretty intense job. We describe clinical decision support as knowledge management."

The top 43 DRGs are those Allina has determined carry the biggest risk. "Every year we look at each of our hospitals and the cost-per-case per hospital. We compare them graphically to identify the best cost performer. The trend is downward on cost-per-case. The order sets drive better quality and lower cost," she says, adding that special software facilitates the cost-accounting analysis.

Doing the right thing

Evidence-based order sets are displayed with a checkmark for easy identification by physicians, who have the option of changing them if they choose. Still, changes are rare, Henry says. Studies show that when physicians can view the evidence at the point of decision they usually follow it. That's an important factor, considering 60% of Allina's physicians are not employed by the organization.

Henry breaks cost-accounting savings from order-set implementation into five buckets. First, best-evidence order sets should drive a reduction in clinical resource utilization, which should improve clinical collaboration. Second, reduction in adverse drug events using an IHI trigger can save $2,000 per avoided ADE. "It's too early to tell what savings we've achieved in this area, but early trends are that we're making progress where standardized order sets are fully adopted," she says.

"Every year we look at each of our hospitals and the cost-per-case per hospital. We compare them graphically to identify the best cost performer. The trend is downward on cost-per-case. The order sets drive better quality and lower cost."

Like any complex technology, PACS drives benefits when implemented under disciplined process change techniques like Lean and Six Sigma. That has led some consulting firms to go at risk for PACS and other digital systems implementations, so sure are they of meeting and documenting ROI targets.

Third, alerts fired for potential drug/drug, drug/food or allergic reactions. "We're seeing two to three per 100 orders firing in our biggest hospital (Abbott Northwestern) and up to five or six alerts per 100 in smaller hospitals. That's enough alerts to be useful, but not too many to cause alert fatigue," she says. Fourth, reductions in documentation work load, especially for health unit coordinators. This is an area that should really kick in with the full adoption of CPOE, which Allina has just implemented.

Finally, there's improved health information management. "We're seeing both hours of transcription and FTEs coming down," says Henry. Another good metric: the number of provider prescriber orders entered is 100% at Allina clinics, 96% at a regional hospital, 85% at another and 55% at Abbott Northwestern. Henry says those are excellent numbers when appropriate verbal orders are factored in at the big medical center.

PACS payback

One of the best indicators that healthcare is making progress in deriving and measuring value from IT is picture archiving and communication systems or PACS. Just two decades ago PACS, which eliminates film by digitizing radiological imaging, was the perfect example of a glitzy, proprietary and prohibitively expensive technology that, along with MRIs and doctor-owned imaging centers, became a poster child for rising healthcare costs.

Today, after two-decades advancement in network infrastructures, software and hardware—and the accompanying "democratization" of medical images throughout the enterprise—PACS is fulfilling its promise as a dramatically more efficient and effective way to produce, manage, distribute and manipulate diagnostic images for better patient care.

That's not to say PACS is plug and play. Like any complex technology, PACS drives benefits when implemented under disciplined process change techniques like Lean and Six Sigma. That has led some consulting firms to go at risk for PACS and other digital systems implementations, so sure are they of meeting and documenting ROI targets.

Dave Dimond, senior VP, Digital Healthcare, TSC Healthcare, Chicago

TSC
Technology Solutions Company

"We always establish a financial plan to ensure both the technology vendor costs and any supplemental consulting services are funded out of a portion of the accelerated benefits," says Dave Dimond, senior VP for Digital Healthcare at TSC Healthcare, a Chicago-based IT-consulting firm. When done correctly, provider organizations can achieve as much as triple the typical rate of return by reducing "straddle costs"—the costs of supporting both manual and digital environments at the same time, he notes.

Dimond cites 10 guiding principles for "digital value creation and realization," or faster ROI:

1. Supplement the project, at key times with diversified, experienced resources:
   - ✓ Clinical workflow optimization and radiology operations;

- ✓ Technical optimization and standards-based integration of modalities and technical infrastructure;
- ✓ Physician adoption and marketing;
- ✓ Project value management.

2. Be data driven and use a results-oriented approach to targeting physician stakeholders, service improvements and operational optimization. Design dashboards and confirm KPIs (key performance indicators) during the charter stage prior to implementation.
3. Recruit physician stakeholders and project champions by promoting future-state value streams oriented around benefits for patient safety, efficiency and effectiveness.
4. Commit to concurrent implementation phasing, focused on achieving maximum value as early as possible versus lower-risk approaches (conducting a pilot, for example).
5. Define outcomes in advance, obtain organizational commitment, instill accountability, provision a utility-like infrastructure (foundation layer), baseline value-added and non-value-added physician time, and ensure current state operations are documented well in advance.
6. Minimize variation in system design and leverage standards-based integration using profiles from the Integrated Healthcare Enterprise (IHE) to enable best-practices for workflow and operational optimization.
7. Measure financial value and costs prior to implementation to ensure that consulting and implementation fees are paid by a percentage of the value delivered.
8. Enhance the capabilities and expertise of the client project team by providing extensive and on-going knowledge transfer, cross-training supported by repositories and e-learning.
9. Build a service and support foundation with clearly defined roles and responsibilities using methodologies from the Information Technology Infrastructure Library (ITIL).
10. Enable the digital environment to support perpetual optimization by provisioning productivity and benchmarking dashboards to empower stakeholders with a collaborative environment for tuning human and system performance. Measure the patient's value-added and non-value added time in the value stream as a key benchmark.

Innovation at Inova

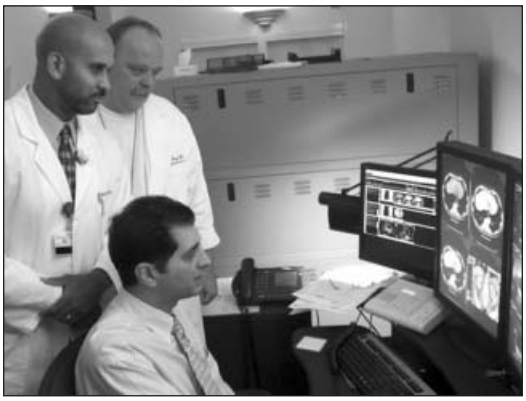
Fairfax, Va.-based Inova Health System, a 1,700-bed integrated delivery system serving more than a million patients a year in the Northern Virginia area, applied those principles to drive quantifiable results from a major PACS implementation during the last two years. Inova, with five acute-care facilities plus a children's hospital and heart institute, was able to cut its projected implementation PACS timetable to six months from 24, gain a high adoption rate among physicians, improve physician satisfaction and optimize workflow to achieve $4 million in incremental cash savings in the first three years, a 3-to-1 ratio of savings to implementation-service fees.

Inova, with five acute-care facilities plus a children's hospital and heart institute, was able to cut its projected implementation PACS timetable to six months from 24, gain a high adoption rate among physicians, improve physician satisfaction and optimize workflow to achieve $4 million in incremental cash savings in the first three years, a 3-to-1 ratio of savings to implementation-service fees.

PACS equipment installed ran the gamut: digital radiography (digital x-ray); ultrasound; CT; mammography; nuclear medicine; x-ray film scanners; diagnostic-reading stations, clinical-review stations; flat-panel viewing stations; and PCs. About a fourth of the overall savings was from eliminating "straddle costs" or duplicative costs that most organizations incur during PACS conversions in supporting film and digital technologies and processes at the same time.

"We turned off film the same day we turned on the PACS," says Randy Damron, director of radiology at Inova Mount Vernon Hospital in Alexandria. "We instantly saw major cost savings, including an x-ray film budget that dropped to only $45,000 from $450,000."

"We turned off film the same day we turned on the PACS," says Randy Damron, director of radiology at Inova Mount Vernon Hospital in Alexandria. "We instantly saw major cost savings, including an x-ray film budget that dropped to only $45,000 from $450,000."



Fred Minor, PACS coordinator, Randy Damron, director of radiology, and John DeGrazia, MD, radiologist, review PACS images at Inova Mount Vernon Hospital, Alexandria, Va.

Space was also a critical issue for the 232-bed hospital whose primary patients are retired CIA and other federal employees on Medicare. "At our facility, radiology is space-limited," says John Degrazia, MD, a 25-year veteran radiologist at Inova Mount Vernon. "There's no room for film. Prior to PACS, we were limited to only six months of historical records," he says, a major impediment to maintaining medical records of elderly patients with co-morbidities requiring multiple imaging studies.

Faster and better

At Inova Fairfax Hospital, Inova's 833-bed tertiary hospital, Cullen Ruff, MD, views 100 patient studies a day as section chief for diagnostic radiology, including abdominal CT, MRI, ultrasound and plain x-rays. In so doing, he's acutely aware of the efficiencies gained from digital information.

"The PACS on the whole has been a godsend. Most of us have found we get a lot more work done per shift than before. We're reading more images efficiently with quicker turnaround time," he says.

And it's not just getting images faster, says Ruff, but acquiring images that are better quality than film and that don't get lost. "Having images available in the hospital for everyone—radiologists and referring physicians—means we get fewer interruptions from people looking for films." While Ruff doesn't have any hard figures for savings from PACS, he says efficiencies gained allowed the department to shift one daytime radiologist position to the evening for better utilization.

Just a sampling of the metrics shows how granular ROI measurements can get when it comes to PACS. For example, at Inova Fairfax Hospital annual costs for film and chemistry alone were reduced by 84%, or nearly $260,000 in savings. Efficiency turnaround—getting reports back and available to doctors—was cut to less than 30 hours on average compared to a previous 61, a 52% improvement. Inova Fair Oaks Hospital, a 182-bed acute-care

INOVA® FAIRFAX HOSPITAL

Cullen Ruff, MD, section chief, diagnostic radiology, Inova Fairfax Hospital, Falls Church, Va.

community hospital near Dulles Airport, was able to cut film-based operational costs by 93%, to about $6,000 from more than $300,000. Even when they go filmless, facilities need to keep some film on hand in case a radiologist asks for it.

For Inova, for which radiology revenues constitute a whopping 31% of the bottom line, a critical metric is physician satisfaction. According to Colleen Cohen, assistant VP for professional services at Inova, a 2005 post-PACS study of physician satisfaction found that 43.2% of physicians rated

Colleen Cohen, assistant VP, Inova Fairfax Hospital, Falls Church, Va.

radiology services as excellent compared to 35.5% the previous year. “I don’t think people realized how important these images are to attending physicians,” she says.

Conclusion

Just as many CEOs and CFOs have learned to love IT without the justification of a hard business case, an intrepid group of clinicians, executives, analysts and consultants continues to chip away at establishing that case. Key is to build those metrics into the IT initiative from the beginning because, while so-called “soft” justification may rule in an industry whose mission is to care for the sick, organizations that find the key to measuring benefits will do the job better and more efficiently.

Scottsdale Institute Conferences 2007/08

Spring Conference 2007
April 25-27, 2007
Camelback Inn,
Scottsdale, Ariz.

Fall Conference 2007
Sept. 27-28, 2007
Cedars-Sinai Health System, Los Angeles, CA

Spring Conference 2008
April 16-18, 2008
Camelback Inn,
Scottsdale, Ariz.

SCOTTSDALE INSTITUTE MEMBER ORGANIZATIONS

Advocate Health Care, Oak Brook, IL

Allina Hospitals & Clinics, Minneapolis, MN

Ascension Health, St. Louis, MO

Billings Clinic, Billings, MT

Catholic Healthcare West, San Francisco, CA

Catholic Health Initiatives, Denver, CO

Cedars-Sinai Health System, Los Angeles, CA

Children's Hospitals & Clinics, Minneapolis, MN

CHRISTUS Health, Irving, TX

Cincinnati Children's Hospital Medical Center, Cincinnati, OH

Clarian Health, Indianapolis, IN

DeKalb Medical Center, Decatur, GA

HealthEast, St. Paul, MN

Heartland Health, St. Joseph, MO

Integris Health, Oklahoma City, OK

Intermountain Health Care, Salt Lake City, UT

Legacy Health System, Portland, OR

Lucile Packard Children's Hospital at Stanford, Palo Alto, CA

McLaren Health Care Corporation, Flint, MI

Memorial Health System, Springfield, IL

Memorial Hermann Healthcare System, Houston, TX

Munson Healthcare Traverse City, MI

New York City Health & Hospitals Corporation, New York, NY

New York Presbyterian Healthcare System, New York, NY

North Memorial Health Care, Minneapolis, MN

Northwestern Memorial Healthcare, Chicago, IL

Norton Healthcare, Louisville, KY

Parkview Health, Ft. Wayne, IN

Partners HealthCare System, Inc., Boston, MA

Piedmont Healthcare, Atlanta, GA

Provena Health, Mokena, IL

Rush University Medical Center, Chicago, IL

Saint Luke's Health System, Kansas City, MO

Saint Raphael Healthcare System, New Haven, CT

Scottsdale Healthcare Scottsdale, AZ

Sentara Healthcare, Norfolk, VA

Sparrow Health, Lansing, MI

Spectrum Health, Grand Rapids, MI

SSM Health Care, St. Louis, MO

Sutter Health, Sacramento, CA

Texas Health Resources, Arlington, TX

Trinity Health, Novi, MI

Truman Medical Center, Kansas City, MO

University of California Los Angeles Medical Center, Los Angeles, CA

University of Chicago Hospitals & Clinics, Chicago, IL

University of Missouri Healthcare, Columbia, MO

University of Texas M.D. Anderson Cancer Center, Houston, TX

SCOTTSDALE INSTITUTE SPONSORING PARTNERS