

MARKET WATCH

Hospital-Physician Portals: The Role Of Competition In Driving Clinical Data Exchange

Hospitals are giving their physicians electronic access to patient data, but market competition impedes communitywide data exchange.

by Joy M. Grossman, Thomas S. Bodenheimer, and Kelly McKenzie

ABSTRACT: Recent policy efforts to encourage the use of health information technology are emphasizing development of communitywide health information exchanges to share clinical data across patient care settings. Interviews in twelve U.S. communities show that most large hospitals have or are developing physician portals to provide admitting physicians with remote access to patient records, but there is little data sharing among unaffiliated organizations. Competition among hospitals for physicians is a key factor driving adoption of these proprietary systems. In contrast, provider and health plan competition and adversarial relationships between providers and plans are viewed as major barriers to communitywide clinical data sharing. [*Health Affairs* 25, no. 6 (2006): 1629–1636; 10.1377/hlthaff.25.6.1629]

A COMPELLING ARGUMENT for speeding the adoption of health information technology (IT) is to provide physicians with timely and complete access to their patients' medical records. The fragmentation of the health care delivery system means that pieces of patients' records are housed at multiple locations, most often on paper. Even when provider organizations have clinical IT systems at a given site of care, the systems have limited ability to "talk with each other." Moreover, data usually cannot be shared electronically across sites within an organization or among affiliated providers, let alone with unaffiliated providers.

While earlier efforts to promote IT focused on adoption within "silos" (isolated settings) of care, broader "interconnecting" of clinicians

has also become a priority for IT advocates more recently. Some providers have begun connecting electronically with others they work with regularly. In contrast, a small number of communities have made progress in developing the infrastructure to support electronic exchange of clinical data among all providers in the market.

The Bush administration is actively leading the development of a national health information network (NHIN) that has at its core an interoperable network of regional health information organizations (RHIOs) that can exchange information across the country. In response, many new multistakeholder organizations have sprung up.¹ However, major challenges remain in developing a nationwide web of operational RHIOs.²

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Little systematic information exists on the extent to which IT is used to share clinical data across care settings within organizations, among affiliated organizations, or on a broader scale. To establish a baseline for monitoring future developments, in 2005 we explored the extent to which clinical data sharing takes place in the twelve communities that are visited every two years as part of the Community Tracking Study (CTS).

We found only limited data sharing across unaffiliated organizations, but we observed hospitals in all twelve sites actively engaged in developing physician portals to share data with affiliated physicians. These proprietary portals give admitting physicians remote access to critical clinical data such as lab and radiology reports and discharge summaries from their patients' hospital records. Hospitals appear motivated for competitive reasons to develop portals to tie physicians more closely to their organization.

The development of physician portals is widespread; however, little has been written about the phenomenon or about the role of health care competition in IT adoption. In this paper we explore in depth how hospitals are using physician portals to share clinical data with affiliated physicians and why. We also review communitywide clinical data-exchange efforts in the twelve CTS sites and the role that market competition is playing in speeding or hindering these efforts.

Study Design

This research was conducted as part of the Round Five CTS site visits completed between January and June 2005. These visits—which explore health system change in local communities—have been conducted biennially since 1996 in twelve sites selected to be nationally representative of markets with populations over 200,000.³ In Round Five, more than 1,000 semistructured interviews were conducted by phone and in person with major health system stakeholders on a wide range of issues.

To assess baseline clinical data-sharing activities, we asked broad, open-ended questions about how the largest acute care hospital

systems, stand-alone hospitals, physician groups, and community health centers (CHCs) in each market were using IT to share clinical data across patient care settings within the organization or with other providers. We also asked about individual and collaborative efforts by health plans and other stakeholder organizations to promote clinical data sharing.

In total, 256 executives in these different types of organizations (for example, hospital chief information officers, or CIOs) were asked about the activities of their own organizations and others. In this paper we report on whether and how portals are being developed in forty-three hospitals and hospital systems. Given the study's focus on the largest providers in each market, our findings do not reflect activity in smaller, stand-alone hospitals. (In the remainder of this paper, we use the term "hospitals" to refer collectively to the hospitals and hospital systems in the study.)

Study Findings

■ **Hospital-based physician portals are widespread.** While clinical data sharing among unaffiliated providers is rare, hospitals' efforts to share clinical data with affiliated physicians via physician portals are widespread. A majority of hospitals in CTS sites—more than 70 percent of the forty-three hospitals we report on—have or are implementing physician portals.⁴

Physicians ordering laboratory and imaging studies in hospitals have traditionally received study results by mail, courier, or fax. Dictated admission and discharge summaries and in-hospital specialty consultations arrive by similar means. Physician portals provide this critical information electronically to admitting physicians via the Internet in their offices, homes, or elsewhere. Portals may also give physicians the ability to perform transactions based on the data, such as ordering tests and signing charts.

Other data sharing. Although less widespread, other clinical data-sharing activities among affiliated providers exist. More than half of CTS sites have at least one large multisite, multi-

specialty physician organization with a centralized electronic medical record (EMR) that allows primary care physicians and specialists to view patient records across practice locations and from home. We found several CHCs—and even a jail system—with centralized EMRs that link their clinic sites.

Data sharing among nonaffiliates. Data sharing among unaffiliated organizations is occurring in only a handful of the CTS sites. These include the well-established clinical data-exchange efforts in Indianapolis and Boston and initial discussions about forming RHIOs by multistakeholder organizations in Lansing, Syracuse, and Seattle.⁵

■ **Physician portals vary in sophistication.** A physician portal can be thought of as a transparent integrator of a hospital's disparate IT systems that provides a unified view of a patient record through a browser interface (similar to Microsoft Internet Explorer).⁶ Most hospitals have many separate, often department-based, clinical IT applications that contain patient data or support clinical transactions, or both.⁷ A hospital may have as many as fifteen or more of these systems, with few linked electronically. Some of these are lab and pharmacy management information systems, basic radiology systems that only provide text reports, and more advanced picture archiving and communications systems (PACS) that transmit digital still and video images. Hospital IT systems may also include EMRs, clinical data repositories, document imaging, real-time documentation or archival document storage, digital dictation, and computerized provider order entry (CPOE) for drugs, tests, and other services.

Some hospitals have been providing remote access to selected clinical applications—mostly lab and radiology—since the late 1980s, but these systems were crude. About 15 percent of study hospitals still use such basic remote-access systems. These systems are transaction-based rather than patient-based, requiring physicians to sign on to each separate hospital IT system to search for each relevant report for a patient. Because these systems are so cumbersome and provide limited

data, physicians rarely use them.

More recently, technological advances have helped spur the development of the more user-friendly physician portal, which requires only a single sign-on to view data aggregated at the patient level from the hospital's various IT systems. The portals in CTS communities vary considerably along a number of dimensions: (1) the types of clinical data and transaction support available, (2) the types of providers who have access to them, (3) the extent to which the systems can communicate electronically with physician-practice EMRs, and (4) the directionality of information sharing (unidirectional from hospital to physician, or bidirectional).⁸

Data and transaction support. Physician portals differ greatly in the types of clinical data and clinical transactions that are supported (Exhibit 1). Portals generally go beyond more basic remote systems that provide lab and radiology results to provide access to a broader array of data, such as admission face sheets, history and physical exam reports, discharge summaries, operative reports, and specialty consultations. About three-quarters of hospitals with portals mentioned that they have or are rolling out access to PACS systems—actual images of x-rays and scans—through their portals. A third of hospitals with portals reported that nurses' notes are available online, while only about 10 percent reported the availability of physicians' notes.

In most hospitals, large portions of medical records are not stored electronically, but hospitals have developed strategies for making nonelectronic patient data available via the physician portal. When hospitals have EMRs, patient information in the EMR is available via the portal. Hospitals without EMRs often indicated that any documents that are transcribed come online in the portal as soon as they are available.

Many hospitals, even those with EMRs, rely on paper charts during inpatient stays. A number of hospitals reported that as soon as possible after discharge, they scan and upload the entire medical record so it is accessible via the portal. For example, Ingham Regional

EXHIBIT 1
Features Of Hospital-Based Physician Portals in Twelve Community Tracking Study (CTS) Sites, 2005

Physician portal feature	Availability in portals			
	All	Most	Some	Uncommon
Clinical data				
Lab and radiology reports	●			
Detailed patient stay information including discharge summaries, operative reports, and consultations		●		
Real-time or archival complete patient record		●		
Picture archiving and communication systems		●		
Real-time nursing documentation			●	
Real-time physician progress notes				●
Intensive care unit data				●
Clinical transactions				
Electronic signature			●	
Computerized provider order entry (CPOE)			●	
Provider-to-provider secure messaging			●	
Integration with physician practice electronic medical records (EMRs)				
Physician practice views/prints out hospital data, can scan into EMR		●		
Hospital data populates EMR			●	
Physicians in hospital can view ambulatory care data				●

SOURCE: Authors' analysis of Round Five CTS site-visit interviews, 2005.

Medical Center in Lansing did not have an EMR but made inpatient records available through the portal within twenty-four hours of discharge and emergency department (ED) records, within eight hours of discharge.

Many hospitals also incorporate one or more transaction capabilities into physician portals. Some portals allow physicians to complete and electronically sign patient records remotely. Digital dictation services may also be offered. Physicians were reported to be able to submit hospital orders electronically using CPOE through a quarter of the portals. Another quarter of hospitals mentioned plans to add this portal feature in the next two years. Some hospital portals include secure electronic messaging systems that allow physicians to share results and consultations.

Some portals have unique features that demonstrate the flexibility and promise of this technology. For example, Baptist Health in Little Rock provided obstetricians with remote access to the hospital's fetal monitoring system. Vital signs for intensive care unit

(ICU) patients were available online at St. Joseph's Hospital Health Center in Syracuse. In Lansing, Sparrow Health System was rolling out a portal at the time of the site visits, with a module that allows physicians to do electronic prescribing in their offices.

Which data and transaction features are available via portals varies greatly by hospital, reflecting in large part the (varying) sophistication of hospitals' underlying IT systems. About a third of the hospitals reported having more-advanced portals that offered two or three of the transactional capabilities and a broader range of clinical data, including, occasionally, ambulatory data.

Who has access. Typically, all admitting physicians have access to the portal. Hospitals may also give access—sometimes more limited—to other providers, such as referring physicians in suburban or rural areas (for example, in Boston and Seattle), clinicians at local CHCs (for example, in Greenville, Indianapolis, and Boston), and home health caregivers (for example, in Orange County and Greenville).

At a number of hospitals, portals have been developed not just for remote access but also for clinicians to use while in the hospital to view data and complete transactions. Similarly, hospital systems in some cases are using, or plan to use, portals to share data across local member hospitals, since few hospital systems have centralized EMRs.

Integration with physician-practice EMRs. In paper-based physician practices, office staff print information from the portal and place it in the paper chart. Some of the heaviest users of portals, however, are hospital-owned and independent practices with ambulatory EMRs. Selected data can directly populate the EMR if the hospital and physician IT systems are compatible; frequently, they are not. Hospitals noted working closely with these practices to develop software interfaces to transfer data between the systems. Despite these efforts, interface problems remain a major stumbling block, with a high proportion of EMR-savvy practices reporting that they must print, scan, and upload into the EMR much of the hospital information collected via the portal.

Directionality. Much of the data in physician portals are shared in only one direction: from hospital to physician. As noted above, some portals have transaction capabilities such as ordering tests or completing and signing medical records that allow data to flow back from physicians to hospitals. We also identified a number of promising examples that allow physicians to use the portals in the hospital to get access to ambulatory care data from the EMRs of closely aligned physician practices. For example, in Orange County, hospitalists and ED physicians at St. Jude Medical Center could view clinical data from the affiliated St. Jude Heritage Medical Group's EMR. On a larger scale, in two major systems in Boston, CareGroup Healthcare System and Partners HealthCare, ambulatory care data from the EMRs of practices of thousands of physicians that partner with the hospitals for managed care contracting could be viewed in the hospital.

Evolving systems. Portals have design flexibility and can be easily upgraded. Most hospitals

make incremental improvements, adding access to additional hospital IT systems and responding to user feedback. Improvements in portal technology support new features such as the ability to send physicians alerts—for example, of abnormal test results.

Recent advances in “system integration technology” are likely to continue to drive the development of new portals as well as upgrades of existing ones.⁹ Hospitals can now build portal interfaces more quickly that permit electronic communication with older, “legacy” systems. In the past, hospitals interested in single-sign-on access to systems had to move to a single IT vendor or force multiple vendors to cooperate in building customized interfaces.

■ **Impact of portals on providers and care delivery.** *Physician use.* Although portals are becoming widely available, many physicians have yet to take advantage of them. Use by physicians varies greatly by hospital; reports ranged from 15 percent of physicians in some hospitals to close to 100 percent in others, notably those hospitals requiring completion of medical charts with electronic signatures. Respondents across the twelve sites reported that physicians in practices that admit a large number of patients to the hospital are the heaviest portal users. As portals become more valuable over time to physicians, with more and easier-to-use features, use increases and physicians begin to demand additions and modifications.

Marketing and support. When a new portal is launched or greatly upgraded, hospitals do outreach and offer training to physicians. Otherwise, hospitals do not market their portals heavily to physicians, relying on word of mouth from other physician-users. Most hospitals do provide ongoing technical support that includes visiting physicians' homes and offices to set up portal access, do training, and provide troubleshooting services.

Return on investment. Few, if any, hospitals appeared to formally assess the return on investment from physician portals, but hospitals did not question the decision to implement a portal even in light of budget constraints. Al-

though they had only anecdotal evidence, hospital and physician respondents believed that remote use of portals saves time and resources for both the hospital and physician practices. As a striking example, physicians that admit to Spartanburg Regional Medical Center near Greenville reportedly were able to order a magnetic resonance imaging (MRI) screen immediately (in medical parlance, “STAT”) from their offices via a portal and see the results within four minutes of the MRI’s completion.

Quality of care. Respondents’ views were more mixed on whether portals improve quality of care. Some respondents noted that timely access to more complete patient data presented in a coherent format cannot help but improve clinical decision making and reduce repeated testing. Others believed that the quality gains from such changes are likely to be small because portals do not incorporate clinical decision-support tools necessary to drive more major changes in physician behavior.

■ **IT as a competitive strategy.** Because hospitals view portals as a “quick win” in contrast to more complex IT systems (EMR and CPOE), they are often implemented first. Hospitals reported that physician portals are lower cost and can be rolled out more quickly, often in six months or less. Because portals are easier for physicians to use and have more direct benefit to them, they are more likely than other IT solutions to improve physician satisfaction and less likely to alienate physicians.

In fact, a main motivation for hospitals to develop portals is a competitive one—to attract and maintain physician loyalty. Hospital respondents view portals as a way to help physicians practice more efficiently and effectively, thereby encouraging them to admit patients to their hospital. Such behavior reflects a broader trend among hospitals to strengthen ties with physicians who direct patients to their facilities.¹⁰

Some hospitals reported that they introduced portals and have enhanced them over time specifically in response to the demands of IT-savvy heavy admitters. Most hospitals with basic remote access systems had plans to move rapidly to single-sign-on portals in response to

physicians’ demands.

In every CTS site, one or two hospitals are leading portal development in the market (and are likely leaders in IT adoption more broadly). Executives at these hospitals, often among those with the largest market share, were explicit that they are using the portal as a competitive strategy to strengthen relationships with physicians.

Markets vary in the proportion of hospitals that are “follower” versus “laggard” hospitals. Active “follower” hospitals are developing portals in response to the competitive pressure, attempting to catch up to or leapfrog over the leaders. Pressure may be particularly acute in markets where many physicians admit to two hospital systems. “Follower” hospitals are often large competitors but sometimes include safety-net hospitals and smaller hospital systems with lower market share. “Laggard” hospitals, with little or no portal development, are often weaker financially and unable to place a high priority on clinical IT activities. They may be small or safety-net hospitals but are sometimes larger hospitals that have experienced short-term, but serious, financial setbacks.

■ **Competition as a barrier to communitywide data sharing.** Although competition is driving the adoption of IT to share clinical data among affiliated organizations, respondents widely viewed competition as a barrier to communitywide data sharing. When asked about collaborative efforts to share data, respondents in most sites noted that the barriers are not just financial and technological. A communitywide effort requires competing and adversarial parties to collaborate and share their most valued asset: patients and their data.

Respondents in most communities were skeptical that operational RHIOs will fully develop in their communities in the near future, in part because of these competitive barriers. From the hospital’s perspective, as one hospital CIO stated, “Our investments in IT are an asset we have. ... The benefits of a RHIO accrue to the community; the hospital doesn’t necessarily benefit from those investments.”

The competitive tensions are broader than

just among hospitals. They also involve competition between physicians, between health plans, between hospitals and physicians, and between physicians and health plans. For example, in national policy discussions, health plans are often looked to as a funding source for communitywide IT development. But in many CTS communities, health plans do not view themselves, nor do other stakeholders view them, as likely conveners of these activities.

In several sites, previous efforts at clinical data exchange failed because of differing opinions between sponsoring health plans and providers over who bears the cost and who controls the data. These failures have engendered lingering distrust, making the hurdles even higher. Some respondents warned that RHIOs could suffer the same fate as community health information networks (CHINs), fostered by policymakers in the 1980s and 1990s. CHINs typically were structured with centralized databases, but providers balked at giving up control of clinical data.¹¹

More recent communitywide data-sharing activities in Indianapolis and Boston have attempted to address these governance and control issues as well as other financial and technological barriers. The most advanced communitywide clinical data sharing under way is in Indianapolis, where most physician practices and the five major hospital systems were expected to have begun receiving basic clinical data electronically by the end of 2005.

In these two communities, a broad group of stakeholders have been working for many years to develop the infrastructure and tools to share clinical data. Respondents in both markets remarked on the willingness of all parties to make the calculated decision to put collaboration over competition for these IT endeavors. In Indianapolis, the university-affiliated Regenstrief Institute is viewed as a neutral third-party facilitator, whereas in Boston, the CIOs of the major stakeholder organizations have built trust by working together for years on multiple communitywide IT projects.

In CTS sites in which communitywide data sharing is just getting off the ground, respon-

dents had a wide range of opinions about how fruitful these efforts will ultimately be. In Lansing, Syracuse, and Seattle, multistakeholder groups created to discuss community health system issues have turned their attention to developing RHIOs. In Lansing, some participants in the effort believed that an eighteen-month timeline to initiate a RHIO was ambitious but feasible. Others said that the process would take ten years, and some felt that a RHIO would never be established. One respondent said, "Right now we are all in the room trying not to kill each other."

Policy Implications

Our study findings suggest that market competition may inhibit the development and sustainability of RHIOs, which are a linchpin of the Bush administration's IT strategy. Local stakeholders' willingness to sponsor or participate in a RHIO will depend, at least in part, on their assessments of the competitive costs and benefits of such arrangements.

As a result, RHIOs may develop at an uneven pace across the country, depending on market conditions. Large hospitals that have already invested heavily in IT and operate in competitive urban markets, such as those in this study, likely have fewer incentives to participate in communitywide efforts. Smaller and rural hospitals may see greater gains from sharing the costs of developing and maintaining IT systems. At the same time, these hospitals may face fewer competitive pressures than their counterparts in urban areas. Anecdotal evidence suggests that RHIO efforts may in fact be under way more frequently in less competitive markets outside major urban areas.

■ **Building sustainable business models.** Developing sustainable business models has been one of the major challenges for RHIOs, many of which have relied on start-up grants. Competitive dynamics may affect which financing model is most viable. Some health information exchanges have provided core IT infrastructure to participating hospitals, not just for clinical data sharing but for the full range of applications (for example, Inland Northwest Health Services in the Spo-

kane, Washington, area). These RHIOs are typically located in less competitive markets where hospitals have not already made large IT investments. Such an approach may be less viable in more competitive urban markets.

An alternative “fee” model relies on collecting per transaction payments from subscribers who may send or receive data via the RHIO. Hospitals’ willingness to pay for sending clinical data to physicians, for example, assumes that participation costs will be lower than current administrative expenses. However, in markets where the largest hospitals have invested in physician portals and already achieved these efficiency gains, this model may be less attractive.

■ **Physician portals versus RHIOs.** The presence of hospital-based physician portals in a market does not preclude establishing a RHIO, however. Although RHIOs provide a limited range of clinical data from providers communitywide, physician portals offer more detailed clinical data from the sponsoring hospital, along with transactional capabilities that are attractive to physicians. Thus, hospitals may decide for a variety of reasons to participate in a RHIO but continue to offer a portal, too, as hospitals in Indianapolis have done.

Given the long time horizon to a national network of RHIOs that interconnect all providers and cover all patients, hospitals will likely continue developing physician portals. Whether these proprietary, “point-to-point” systems are an intermediary step in the evolution of a nationwide system of clinical data exchange remains to be seen.

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NOTES

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2. J. Halamka et al., “Exchanging Health Information: Local Distribution, National Coordination,” *Health Affairs* 24, no. 5 (2005): 1170–1179; M.E. Frisse, “State and Community-based Efforts to

- Foster Interoperability,” *Health Affairs* 24, no. 5 (2005): 1190–1196; J.M. Overhage, L. Evans, and J. Marchibroda, “Communities’ Readiness for Health Information Exchange: The National Landscape in 2004,” *Journal of the American Medical Informatics Association* 12, no. 2 (2005): 107–112; and Connecting for Health, *Financial, Legal, and Organizational Approaches to Achieving Electronic Connectivity in Healthcare*, October 2004, http://www.markle.org/downloadable_assets/flo_sustain_healthcare_rpt.pdf (accessed 18 September 2006).
3. The twelve sites are Boston; Cleveland; Greenville, S.C.; Indianapolis; Lansing; Little Rock; Miami; northern New Jersey; Orange County, Calif.; Phoenix; Seattle; and Syracuse.
4. Our finding on the widespread development of physician portals is consistent with two recent surveys of hospitals, whose findings suggest that many large hospitals are offering physicians remote access to clinical data. See American Hospital Association, *Forward Momentum: Hospital Use of Information Technology* (Washington: AHA, 2005); and C. Moylan et al., *Health Information Technology Source Book: Findings from the 2004 Electronic Medical Record Survey* (Washington: National Association of Public Hospitals, 2005).
5. C.J. McDonald et al., “The Indiana Network for Patient Care: A Working Local Health Information Infrastructure,” *Health Affairs* 24, no. 5 (2005): 1214–1220; and J. Halamka et al., “Health Care IT Collaboration in Massachusetts: The Experience of Creating Regional Connectivity,” *Journal of the American Medical Informatics Association* 12, no. 6 (2005): 596–601.
6. G. Gillespie, “Systems Integration: The Electronic Records Linchpin,” *Health Data Management* 13, no. 5 (2005): 34–36, 38, 40.
7. For prevalence of different types of hospital IT systems, see AHA, *Forward Momentum*; and Moylan et al., *NAPH Health Information Technology Source Book*.
8. Study results underestimate the degree to which specific physician-portal features are offered. Respondents were asked broad, open-ended questions about clinical data-sharing activities that were not tailored specifically to ask about portals or their features. In answering, some respondents might not have highlighted features that others mentioned.
9. Gillespie, “Systems Integration.”
10. R.A. Berenson, T. Bodenheimer, and H.H. Pham, “Specialty-Service Lines: Salvos in the New Medical Arms Race,” *Health Affairs* 25 (2006): w337–w343 (published online 25 July 2006; 10.1377/hlthaff.25.w337).
11. Halamka et al., “Healthcare IT Collaboration.”