

dbMotion Case Study University of Pittsburgh Medical Center (UPMC)

“dbMotion actually ‘connects the dots’, integrating our silos of information and enabling us to truly provide the patient-centered care that our patients have come to expect.”

*G. Daniel Martich, MD
Chief Medical Information Officer
Associate Chief Medical Officer
University of Pittsburgh Medical Center*

UPMC Enhances Patient Care with the dbMotion™ Solution for Interoperability

The University of Pittsburgh Medical Center (UPMC), a major US healthcare provider, had invested heavily in information technology to help provide the highest quality patient care throughout its acute and ambulatory care facilities. Despite IT solutions that included single-vendor systems and best-of-breed alternatives, caregivers were still not able to view essential, unified patient information across the continuum of care.

Clinicians were committed to making the best care decisions; however, for patients who visited multiple UPMC facilities for diagnostics and treatment, information availability was particularly problematic. Connecting community care with and across inpatient environments was a challenge – as it is for just about every healthcare network in the US. This is especially true in emergency and urgent care settings. When a patient needs care, you don’t know what you don’t know.

In 2008, UPMC implemented the dbMotion Solution – the health interoperability and intelligence solution that has helped caregivers obtain access to meaningful, integrated patient information across inpatient, outpatient, physician office and other settings. Patient outcomes have improved, major clinical workflow efficiencies were gained, and treatment duration has been shortened.

As one of the largest and most advanced interoperability deployments in the world, UPMC has set the benchmark for efficient, quality care by successfully integrating and leveraging the network’s patient information.

UPMC at a Glance

The Challenge

- 200+ disparate systems
- No integrated view of patient information across the care continuum
- Caregiver time wasted searching for information
- Inefficient use during patient/caregiver interaction due to lack of information
- Clinical decisions made only with information that could be located
- Compromised relationships with affiliate physicians due to minimal information-sharing

The Solution

- dbMotion™ Solution implemented to integrate and aggregate data into meaningful, actionable information
- Leverages and integrates with existing systems within current clinical workflows
- Incorporates essential data: demographics, diagnoses, problems, allergies, medications, clinical notes, microbiology results, laboratory test results, documents, discharge summaries and more

Outcomes

- Improved patient care and outcomes
- Reduced patient care delays
- Enhanced caregiver decision-making
- Improved caregiver satisfaction and better affiliate relationships
- Streamlined operations
- Strategic IT positioning for the future

About UPMC

- 20 hospitals (4,000+ beds)
- 4.5 million annual outpatient visits
- 170,000 annual admissions
- 400+ outpatient locations
- 4,700+ affiliated physicians



The Challenge: Leveraging Cross-facility Patient Information for Optimal Clinical Decision-making

The University of Pittsburgh Medical Center's wide array of clinical systems support hospital-based patient care; in addition to the dozens of ancillary and physician office systems serving the community. Even with a configuration of over 200 systems, caregivers did not have access to essential patient information across diagnostic and treatment settings.

Minimal Cross-facility Integration

In many ways, UPMC operated as a true health system, with cross-facility coordination, research cooperation, and administrative efficiencies of scale. However, when it came to having meaningful patient information that would show the patient's medical condition regardless of the treatment setting, information was maintained independently. There was no system sophisticated enough to collect, aggregate, and share information for clinical decision-making.

Leveraging the Advantages of the Health Network

While this internationally recognized health system provided outstanding medical care to millions of patients, caregivers spent too much time on manual patient information collection, organization, and interpretation. Caregivers and administrators knew they could drive quality and efficiency through the ubiquitous availability of integrated information. UPMC wanted to leverage the advantages of being a health network for the benefit of its patients. With comprehensive patient information at their fingertips, UPMC caregivers were confident they could more efficiently and effectively make thorough decisions, which would improve upon the world-class care they provide.

The Solution: Health Interoperability and Intelligence Platform across the Continuum of Care

In evaluating the types of approaches that would address its needs, UPMC recognized that the solution did not lie with another hospital information system, interface engine, or portal. The solution was a health interoperability and intelligence platform that would transform disparate medical data maintained in different formats and structures at multiple facilities into an integrated meaningful multidisciplinary patient record. After a careful and thorough search and selection process, UPMC implemented the dbMotion Solution. dbMotion integrated and aggregated data from more than 25 major clinical systems, such as laboratory test results, problem lists, and documents into a unified and harmonized structure. Using this information framework, dbMotion further semantically harmonized essential UPMC patient information such as medications and allergies whose sources were diverse vocabularies and terminologies.

These sophisticated features and dbMotion's web-based, user-friendly Clinical Views™ functionality present meaningful information to caregivers within their existing workflows to support clinical decision-making. Because of the intuitive nature of the system, training was minimal.

The solution took just eight months to implement – from project kick-off to on-time delivery. Within six months of implementation, there were thousands of clinical and administrative users, far exceeding planned usage. Adoption rates are expected to continue to grow rapidly in the coming years.

The solution works securely with UPMC's broad array of vendor and proprietary applications, and did not require replacing existing information systems.

Impact at the Point of Care

A middle-aged man was brought to UPMC's ED in an unconscious state. There was no history on this patient in the hospital's EMR. Using UPMC's dbMotion system to view the comprehensive patient record, the ED physician discovered that the patient had chronic liver failure, in addition to secondary issues including Hepatitis C. The physician was able to rapidly make the diagnosis of hepatic coma and prescribe medication quickly to lower the patient's life threatening ammonia level. In addition to the hospital policy of "universal precautions," the care team was notified of the patient's blood borne pathogen status (Hepatitis C).



The Technical Solution

The UPMC-dbMotion architecture consists of one central dbMotion 'node' connected to UPMC's essential clinical and demographic best-of-breed systems; such as Cerner, Epic, McKesson, MEDITECH, Siemens, Misys, Quest Diagnostics, HBOC Star, Dictaphone, and Spheris as well as dozens of ancillary and physician office systems.

Over 200,000 HL7-formatted data messages are transmitted daily from source systems to dbMotion via UPMC's message router.

The configuration supports future expansion and scalability to other UPMC applications as well as to emerging state/regional exchanges.

The dbMotion Solution is a service oriented architecture (SOA) based technology, which supports modularity, uniformity, flexibility, and scalability. The system enables and accelerates the development and integration of new applications.

Standard and customized dbMotion Clinical Views present the harmonized information integrated within UPMC's Cerner PowerChart and Epic Epicare system workflows. The solution offers a rich set of advanced software services to a variety of UPMC consumers; such as electronic medical records, web views, computerized physician order entry modules and other clinical and operational applications.

The entire solution operates under tight end-to-end security integrated to use existing Active Directory user sets and permissions, to authenticate each user, and gate-keep with strict access authorization and tracking mechanisms.

Five years of patient information history is maintained and readily accessible.

Outcomes: Far-reaching Benefits

Patient Care Improvements

With meaningful patient information from multiple UPMC facilities available immediately, caregivers have been able to diagnose conditions more easily and target therapies more effectively. For example, having medication information from previous or ongoing treatment has prevented potential drug-drug interactions and has identified patient narcotics abuse. Previously reported allergy information has prevented serious medical consequences during testing and treatment. Caregivers have also taken precautions against patients with known infectious diseases.

Because clinicians are able to easily access previous test results, patients are subject to less duplicative testing, thereby reducing hassles, pain, and unnecessary expenses.

Efficiencies

Caregivers spend a lot less time and effort searching for information, which helps streamline activities and prevents delays in care. For example, there has been a 50% increase in patient readiness for surgery. Surgery wait time has been reduced because of an 80% reduction in preoperative information collection time.

Affiliate Physician Loyalty

Because of these improvements and the availability and easy access of patients' hospitalization and outpatient visit information to referring and affiliate physicians, these doctors are pleased with the service they receive and this thereby encourages them to continue being loyal referral sources for UPMC.

More Benefits than Expected

Initial implementation met UPMC's scope and timeframe objectives, while also including advanced functionality originally expected only at later project phases, such as integration with the health system's electronic medical record systems and semantic interoperability features.

Solidified IT Infrastructure

The dbMotion implementation also succeeded in helping secure UPMC's information technology infrastructure investment over the long term, positioning the organization well for future system transitions.

“dbMotion helps us deliver on our vision of ensuring that the right clinician has the right information to make the right decision for the right patient at the right time... every time.”

*Tamra E. Merryman
Chief Quality Officer
University of Pittsburgh Medical Center*

What's Next: Platform for Strategic Expansion

UPMC's new infrastructure positions the health system well for incremental patient care enhancements, improved financial measures, and streamlined operations. Already in the works are projects to:

- Scale to new facilities inside and outside the network
- Incorporate additional clinical information, such as radiology reports and links to PACS images
- Support physician pay for performance (P4P) programs
- Reinforce compliance with core measures and regulations, such as Present on Admission (POA) reporting and preventing never events
- Achieve higher levels of semantic interoperability

Given the size and scope of UPMC's success, this initiative provides a model which could be expanded to a state or national level.

UPMC administrators agree that the dbMotion foundation has been one of the single largest improvements in information technology in years. The interoperability strategy has helped UPMC achieve its short term goals, and gives the health enterprise the flexibility to attain major benefits over the long term.

Samples of UPMC Clinical Views Functionality





About dbMotion

dbMotion is an innovative provider of health interoperability and intelligence solutions. It develops and markets the dbMotion™ Solution, a proven SOA-based platform that enables healthcare organizations and health information exchanges (HIEs) to meaningfully integrate and leverage their information assets, driving improvements in the quality, safety and efficiency of patient care. This approach transforms care through the creation of a virtual patient record by logically connecting a group of care providers and organizations without requiring the replacement of existing information systems. By providing ubiquitous access to integrated patient information the solution connects care settings and bridges gaps that often exist between inpatient/acute care and community care, empowering clinicians and demonstrating a compelling return on investment (ROI). This robust solution is field-proven having been implemented in some of the world's most demanding healthcare IT environments since 2001. The company's investors include Vertex Venture Capital, Pitango Venture Capital, Gemini Israel Funds and the University of Pittsburgh Medical Center (UPMC).