



CAREfx[®]
Simply Advancing Healthcare



Patient Information Aggregation: A Strategic Approach to Information Management for Healthcare

WHITE PAPER

About Carefx

Carefx supports healthcare organizations in achieving their vision of advancing the quality and safety of patient care delivery through its Fusionfx solution suite. Fusionfx streamlines and simplifies clinical and business workflow and connects care providers to the information they need, where and when they need it. Fusionfx delivers crucial patient information with speed, efficiency, and logic by managing care transitions and information gaps between diverse departments, systems, and facilities. Carefx supports more than 400 hospitals, health systems, regional health information organizations (RHIOs), and health information exchanges (HIEs) across North America and Europe.

Founded in 2002 and headquartered in Scottsdale, AZ, Carefx can be reached at (480) 833-5010 or by email at info@carefx.com. Visit www.Carefx.com for more information.

Table of Contents

Introduction	4
Challenges in Managing Patient Information	4
Solving the Patient Information Quagmire	5
On the Path to Recovery	5
Strategic Information Management: Information Aggregation	6
Patient Information Aggregation Tools Used in Clinical Environments	6
Single Sign-On	7
Context Management	7
Compliance Management	7
About Fusionfx®	8
How Fusionfx® Works	8
Before and After	9
Clinical Benefits	11
IT Benefits	11
Conclusion	11

Introduction

Hospitals of all types and sizes are deluged daily with increasing amounts of patient data. Managing it is a daunting challenge, particularly when data volume is estimated to double each year. Though much of the data resides in advanced databases or legacy systems, only a small proportion is integrated. As a result of this lack of integration, hospitals constantly confront a data overload and a contextual knowledge shortage, which leads to less than optimal workflows and patient outcomes.

In a fast-moving clinical setting where time-pressed doctors and nurses need information immediately to accurately diagnose and treat patients, this “data overload/contextual knowledge shortage” presents a formidable challenge. While patient information exists, it’s spread throughout different databases and applications making simplified access problematic for those who need it most. Clinicians need unique passwords and IDs for each individual application. In addition, they must repeatedly search for the desired patient every time they access an application. With hundreds of clinical applications in a hospital, navigating these log-on/out and search obstacles is quite substantial, time-consuming and unproductive.

Worse still is that even when a search for patient data is successful, its presentation is often not contextually meaningful, preventing a clear, crisp picture of the patient’s real status from coming into focus. Some records exist or are accessible; others are not. The amount of lost productivity as a result of the lack of contextually meaningful data is enormous. Nearly one-third of clinicians’ time is spent searching for and gathering patient data, and at least one important piece of information is missing in nearly 80% of patient encounters.

This paper addresses the strategic benefits of Patient Information Aggregation, an emerging category within healthcare that effectively addresses and eliminates the challenges noted above. In one seamless and interoperable platform, Patient Information Aggregation sleekly combines Single Sign-On, Context Management and Compliance Management technologies and tools, resulting in improved workflows, patient care, application utilization and IT ROI. In particular, this paper reviews the specific elements of Fusionfx®, healthcare’s first strategic, open and scalable Patient Information Aggregation platform that is the preferred platform of industry-leading infrastructure and HIT vendors, including Cerner, Eclipsys, GE Healthcare, McKesson, Siemens Medical Solutions, IBM, CA, Citrix, Imprivata, and Novell.

Challenges in Managing Patient Information

Most hospitals have deployed and maintain hundreds of clinical applications. While essential to enhancing care delivery, these applications can present steep learning curves for those who use them. Even when mastered, applications still present redundancies that clinicians loath. For physicians, surgeons, nurses and other healthcare professionals who must quickly address various clinical situations, accessing patient data within heterogeneous computing environments (thin-client, terminal-emulated, native PC and Java) requires multiple passwords,

access procedures and patient selection requirements. Navigating in and out of different applications to locate patient information is nothing but frustrating and time-consuming.

This tediousness impacts efficient care delivery in many ways, most notably:

- inaccurate and incomplete patient histories
- superfluous testing
- unnecessary and invasive procedures
- erroneous diagnoses or treatment protocols; and
- inadequate reimbursements.

Because timely and simplified access to accurate patient information is critical to providing quality outcomes, hospitals are seeking to remove the obstacles that impinge on optimal care delivery.

Solving the Patient Information Quagmire

Hospitals that have spent years and millions of dollars purchasing, deploying and maintaining clinical applications face a quandary: what to do with applications that operate in silos. Critical to one or more clinical constituencies in the hospital, these applications are the lifeblood of the patient information flow. Essentially, hospitals face two basic options:

Option 1: Sunset all of their applications and start from scratch with a brand new slate of fully integrated and homogenous applications; or

Option 2: Extend the life of applications by converting them into context-aware applications or by overlaying intuitive, attractive GUIs that make them easier for clinicians to use them.

The first option is prohibitively expensive. While a fully integrated set of clinical applications might seem like nirvana, the practicality of it is out of scope. Few healthcare providers can afford to completely abandon their sunk investments in technology. The second option is far more attractive and reasonable. It allows hospitals to continue to amortize the purchase price of the applications over a longer period – thus increasing the ROI – and it prevents a disruption in workflow and clinical processes.

On the Path to Recovery

In pursuing Option 2 above, some hospitals have chosen to deploy Single Sign-On (SSO) technology. While this is a wise choice for streamlining a clinician's log-on process, SSO solutions are really just the first step toward a holistic cure. Deployed alone, they do not eliminate a clinician's need to navigate multiple and disparate applications to locate patient data.

Increasingly popular in combination with SSO solutions is Context Management. This entails enabling applications to “speak” to and among each other. While not integrated at the back-end, context-aware applications share corresponding data at the user level and operate almost as if they were integrated.

Paralleling these technologies are Compliance Management technologies, which provide the engine for security, privacy, tracking and regulatory compliance.

Analyzed separately, each of these solutions solves a very specific point of pain within healthcare environments, and each is enormously valuable in many respects. But when they’re combined into a single, open and scalable platform, their tactical functionality transforms into a strategic solution. The whole is, indeed, greater than the sum of the parts.

Strategic Information Management: Information Aggregation

“Information aggregation” is a cross-industry term that defines the tools and technologies that allow users to combine, codify or transparently merge the visual representation of data across data-source frontiers. Specifically this might include:

- Tools that move or copy data from multiple data sources to a master aggregated data repository; or
- Tools that access data from multiple data sources and then combine it temporarily for specific, cross-database query purposes.

We label this “aggregation” instead of “integration” because it more accurately describes the nature of the combination and linking of permanent and temporary data.

When there’s a need to manage information more strategically, information aggregation is an ideal coordinated approach for fully leveraging an entity’s existing application investments. Because of its ability to create and maintain links between various and multiple data sets in a distributed environment, information aggregation enables an organization to clearly identify data sources most needed for codification. Within healthcare environments specifically, the platform category is Patient Information Aggregation.

Patient Information Aggregation Tools Used in Clinical Environments

As noted previously, there are three main information aggregation tools used by hospitals that streamline sign-on procedures, simplify access to real time patient data and ensure security, patient privacy and compliance with regulations. These include:

Single Sign-On - allows clinicians to sign-in to all relevant applications with a single user name and password.

Context Management - enables clinicians to select a patient's name once in an application and have their screen automatically populate with links to that patient in other applications.

Compliance Management - automatically tracks each occurrence of patient information access for security, privacy and compliance purposes.

Single Sign-On

In any client/server environment, SSO is a session authentication process that allows a user to enter a single user ID and password in order to access multiple applications. The SSO, required for the initiation of the session, authenticates the user to access all the applications they have been authorized to access on the server and eliminates all future authentication prompts when the user switches applications during that particular session. SSOs are estimated to reduce clinicians' mental processes significantly.

Context Management

Context Management provides a means for non-integrated, non-interoperable applications to link information at the user interface level so they appear to act like a single system. In so doing, the applications operate in a context-aware environment and allow users to access and review all relevant patient data in a unified view regardless of where the data is stored.

Information stored in context could, at a minimum, include a patient's name and various identifying numbers. Applications operating in a context-aware desktop, kiosk or portal environment will present information about the same patient, encounter, and observation.

Within such a platform, a Context Manager function is responsible for establishing the links among the applications, which serve as Context Participants. Context Participants synchronize after querying the Context Manager to determine the current context and when to update the context. Context Management also supports Mapping Agents, which map equivalent identifiers when the context is updated so that all participating applications can interoperate.

Compliance Management

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) outlined specific rules for security and privacy for healthcare organizations that electronically maintain or transmit "protected health information." The rules designate how healthcare providers must manage access to information by users, from identity creation to tracking to termination. Driven by these regulatory requirements, Compliance Management solutions were spawned to secure access to hospital information assets. In general, Compliance Management solutions comprise authorization management, patient access tracking, auditing and reporting services.

About Fusionfx®

Fusionfx® is the first Patient Information Aggregation platform designed specifically for the healthcare provider environment. Strategic, open and scalable, it offers unprecedented interoperability among leading SSOs, Context Management and Compliance Management technologies. More specifically, it aggregates patient data from diverse applications and databases into a unified view – in the application’s native form in a desktop/kiosk environment or via the web in a portal view - wherever and whenever it’s needed. Clinicians need not hunt for patient data; it comes to them. Regardless of IT systems, unique user names and passwords or individual applications, Fusionfx® brings a patient’s status into crisp, clear focus. Transparently and automatically, Fusionfx® also meets regulatory compliance requirements by creating an audit trail detailing each occurrence of patient information access across all applications.

How Fusionfx® Works

After a clinician logs into an individual application, selects a patient, encounter or observation, Fusionfx® automatically finds and links related patient information in all other applications. Everything a clinician needs to know about that patient will be presented within seconds. Repetitive searching is eliminated as is wondering if all relevant information about the patient is known.

Because each hospital’s application environment is distinct, Carefx offers a broad portfolio of value-added solutions that enhance application functionality and extend the life of existing applications.

Application Extensions plug clinical applications into an HL7 standards-based desktop framework without modifying the application itself. Effectively, they monitor applications, detect when patient data has changed and notify other applications via Fusionfx®. As a result, the user’s experience and workflow improve noticeably.

Application Viewers are attractive, intuitive GUIs designed for less than attractive or non-intuitive legacy applications. Effectively, viewers put a “face lift” on legacy applications so clinicians find them simpler to use. Viewers participate with other portlets within a portal environment, and integrate with other context enabled applications. Built on top of JSR-168, viewers can run in many different portal frameworks.

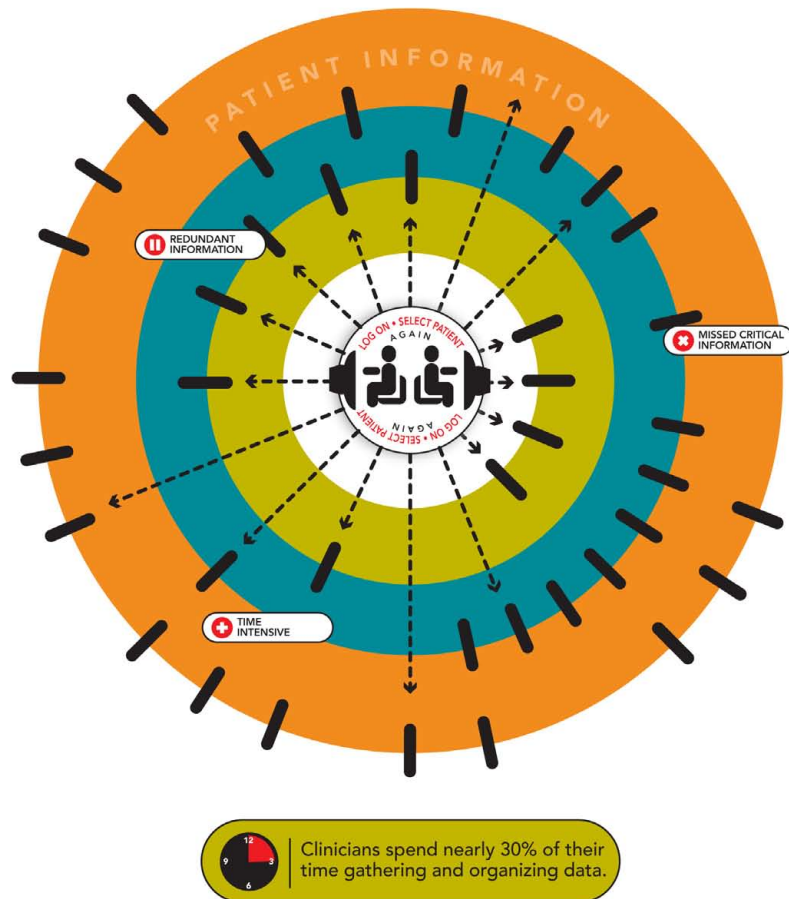
Before and After

The following illustrations show the dramatic differences between the “Before” and “After” of Fusionfx®. In the first illustration, clinicians must endure a lengthy process to sign-on, launch applications, navigate to data, assess results and then repeat the process in every other relevant application. In the second illustration, the sleek, intuitive and direct nature of Fusionfx® is clearly evident.

DOES THIS SOUND FAMILIAR?

- | | | |
|---|--|---|
| { | <ol style="list-style-type: none"> 1. Launch application. 2. Enter your username and password. 3. Select patient. 4. Wait for screen to populate. 5. Assess results and findings. | } |
| | <ol style="list-style-type: none"> 6. Take action or enter order. 7. Wonder which other applications have relevant patient data. 8. Return to Step 1. 9. Repeat entire search process over and over and over and over. | |

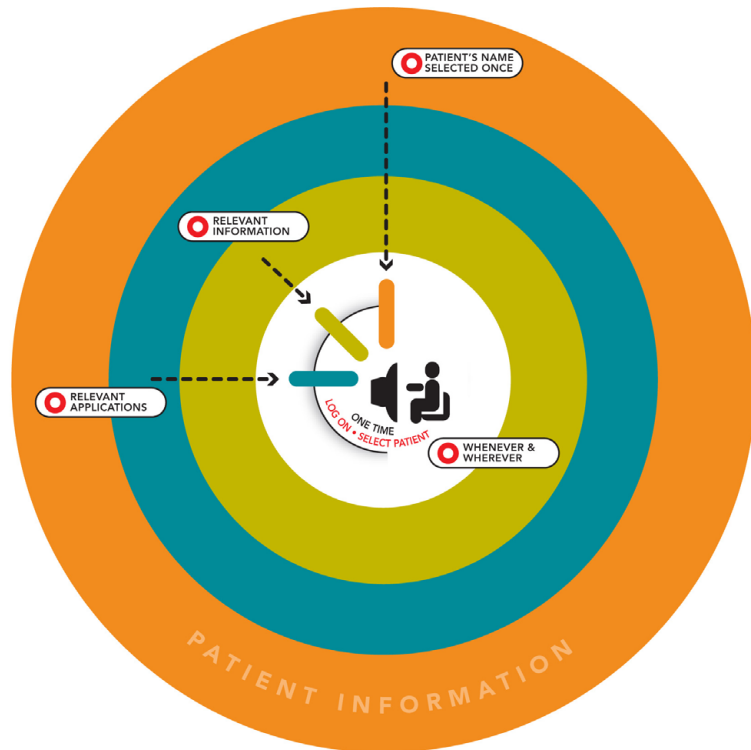
The result: Frustration and wasted time.




DOES THIS SOUND BETTER?

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Sign-on ONCE from anywhere (Kiosk, desktop, portal, etc.) and Select patient. | <ol style="list-style-type: none"> 2. Assess aggregated results and findings in context. 3. Take action or enter orders. |
|--|--|

The result: More time for Doctors to doc and Nurses to nurse.



 Instant aggregation of patient data from diverse applications and databases into a unified view.

Clinical Benefits

Chief Medical Officers and clinicians want Fusionfx® because it:

- Increases productivity by automatically streamlining clinical workflow and aggregating patient information from disparate applications, allowing more time for patients.
- Simplifies access to a patient's information, whenever and wherever it's needed.
- Improves clinical efficacy and patient safety by simplifying access to a patient's complete clinical record, ensuring quality and cost-effective care.
- Replicates and tracks with how clinicians think and operate, eliminating the need to re-learn workflow based on new applications applications.
- Lets clinicians practice medicine rather than IT.

IT Benefits

Chief Information Officers and IT staff want Fusionfx® because it:

- Enhances application utilization and return on IT investments.
- Helps healthcare organizations maintain regulatory compliance by centralizing and transparently recording patient information access events.
- Grows with healthcare organizations via an open and scalable platform that interoperates with any application, operating system or hardware.
- Deploys in a matter of months in a non-disruptive and cost-effective manner.
- Interoperates with leading HIT and infrastructure vendors such as McKesson, Cerner, GE Medical Systems, Siemens Medical Solutions, Novell, Computer Associates, IBM and others.

Conclusion

Information aggregation is a sleek business and IT strategy that enables healthcare organizations to tackle their patient data quandaries. When accomplished in an agnostic, scalable platform, like Fusionfx®, its strategic value can be optimized because it can interoperate with existing applications, HIT platforms and systems.



CAREfx[®]
Simply Advancing Healthcare

Carefx Corporation
7500 N. Dobson, Suite 200
Scottsdale, AZ 85256
P 480.833.5010
F 480.649.9142
www.carefx.com