



MidSouth eHealth Alliance

Redwood MedNet Conference July 18, 2008

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Vanderbilt Center for Better Health

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This presentation has not been approved by the Agency for Healthcare Research and Quality

Today's Presentation

- ◊ Overview of the exchange
- ◊ Background
- ◊ Privacy and Security*
- ◊ Technology/Operations
- ◊ Sustainability**
- ◊ Questions

◊ *Acknowledgement of Vicki Estrin, Program Manager

◊ **Acknowledgement of Mark Frisse, M.D. Project Director and Rodney Holmes, CPA, Consultant



Current Status of the MidSouth eHealth Alliance (MSeHA)

- ◆ Regional exchange operating in the 3 county region in southwest Tennessee
- ◆ Memphis is the major city in the region
- ◆ Operational since May 2006
- ◆ Project planning phase Aug 2004 – Jan 2005
- ◆ Project implementation initiated in January of 2005
- ◆ Access to the system occurred in the emergency departments of the Memphis hospitals, initially
- ◆ Data is from Inpatient/Outpatient setting, Ambulatory and Claims

The screenshot shows the homepage of the MidSouth eHealth Alliance. At the top, the logo reads "MIDSOUTH eHEALTH ALLIANCE" with a graphic of three stylized figures. Navigation links for "Home" and "FAQ" are in the top right. A large banner image shows several hands of different skin tones reaching towards the center, with the text "Connecting Healthcare" and "MidSouth eHealth Alliance is working for you." below it. To the right is a "Log In" section with fields for "USER ID:", "PIN:", and "TOKEN:", and a "Submit" button. Below the banner is a "Welcome" section with a paragraph about the alliance's mission. A "Participants" section features logos for "BAPTIST MEMORIAL HEALTH CARE", "MEMPHIS MANAGED CARE", "THE MED Regional Medical Center at Memphis", and "Saint Francis Hospital Tenet Tennessee". A "SPECIAL ANNOUNCEMENT" section mentions the Tennessee chapter of HIMSS and its partners. A "Fact Sheet" section offers a PDF download for frequently asked questions.

MidSouth eHealth Alliance – we have grown from May 2006 to May 2008

- ◆ We started with empty vaults on May 3, 2006
- ◆ Nearly 3 million patient encounter records
- ◆ Total number of MRNs 1,050,000
- ◆ Over 64 million lab tests (growing at a rate of 88,000 per day)
- ◆ 1.3 million Imaging reports (growing at almost 2,000 per day)
- ◆ Over 16,000 dictated discharge summaries
- ◆ Over 218,000 anatomic path reports
- ◆ Approximately 40,000 other clinical notes



Background



- ⚡ The MidSouth eHealth Alliance is a 501(c)3 organization that serves citizens in the Greater Memphis area
 - Approximately 1.1 million citizens
 - Includes citizens from Arkansas and Mississippi
 - 25% of the Shelby County citizens are at or below the poverty line
- ⚡ Began as a state funded planning project in August 2004. Awarded an AHRQ State & Regional Demonstration contract in September 2004. Also received additional state funding (\$4.8 million from AHRQ and \$7.2 million from the state)
- ⚡ Board was founded in February 2005
- ⚡ Initial Participants were and continue to be represented on the Board
 - Baptist Memorial Health Care Corporation (5 facilities including one in MS)
 - Christ Community Health Services (4 clinics)
 - Memphis Managed Care Corporation (TennCare MCO)
 - Methodist Healthcare (7 facilities including LeBonheur Children's Medical Center)
 - The Regional Medical Center (The MED)
 - St. Francis Hospital & St. Francis Bartlett (Tenet Healthcare)
 - St. Jude Children's Research Hospital
 - Shelby County/Health Loop Clinics (11 primary care clinics)
 - UT Medical Group (400+ clinicians)

Background



- ◆ Participants identified data elements to be available and agreed to provide clinical and demographic information from all encounters inpatient, outpatient and emergency department.
- ◆ The board identified the first point of access to be the Emergency Department but is now expanding access point to the system. **The primary concern with expanding access is privacy and confidentiality.**
 - First emergency department began using the system on May 23, 2006
 - Today we have 14 hospital emergency departments using the system
 - Hospitalists in three health systems began accessing the system in September 2007
 - Clinicians at 15 clinics: Christ Community (Sept. 07) and Health Loop Clinics (Feb. 08) access the system

We continue to add data to the system. We do not have a minimum data set, instead we encourage organizations to send what they can.

▶ 20+ data feeds submit IP, OP, ED and claims information

- Patient identification/demographics
- Lab results
- Encounter data: date of service, physician and reason
- Medication history from claims
- Allergies (test)
- Dictated Reports
 - Imaging studies
 - Cardiology studies
 - Discharge summaries
 - Operative reports
 - Emergency room summaries
 - History and Physicals
 - Diagnostic Codes
 - Some medication history (TennCare Claims)
 - Etc.

The screenshot displays a web-based medical information system interface. At the top, there is a navigation bar with tabs for 'Clinical', 'Calendar', 'Bottom Frame', 'Med', 'Demographics', and 'Print Summary'. Below this is a search bar and a 'Patient Search' section with fields for Name, SSN, and MRN. The main area shows a list of search results for a patient with MRN 0000579114, including various lab and imaging studies. A 'Patient Selection' sidebar on the left lists different sites and dates. A 'Full Demographics' section provides detailed patient information, including name, DOB, gender, race, SSN, and address. A 'patient search result' box at the bottom shows a table of search results.

MRN	NAME	DOB	SEX	SSN	SITE	DOS
0000579114	[REDACTED]	12-MAY-06	M	XXX-X5-3337	Baptist Memphis (East)	06/01/2006
0000579114	[REDACTED]	12-MAY-06	M	XXX-X5-3337	Methodist Healthcare	06/01/2006
0000579114	[REDACTED]	12-MAY-06	M	XXX-X5-3337	Methodist Healthcare	06/03/2006
0000579114	[REDACTED]	12-MAY-06	M	XXX-X5-3337	The Regional Medical Ctr	05/31/2006
0000579114	[REDACTED]	12-MAY-06	M	XXX-X5-3337	St. Francis Hospital	05/31/2006
0000579114	[REDACTED]	12-MAY-06	M	XXX-X5-3337	Saint Francis-Bartlett	05/12/2006

Our approach to privacy and security – background

- ⌘ Early on in the project, technology was the focus – in fact we ignored privacy and security for some time. Big mistake
- ⌘ Technology was a challenge; however, early on one principle we followed was that policy should/would drive technology (this was a principle from day 1).
- ⌘ We formed a Privacy and Security Work Group
 - They were chartered to make recommendations to the Board
 - All stakeholders have representation
 - No one was turned away from participating – even if they weren't directly related to a Participant
 - Met face to face at least once a month for 4–6 hours at a time and usually had conference calls (1–2 hours) in between
- ⌘ We had early access to the Connecting for Health Framework on Policy (www.connectingforhealth.org)
- ⌘ We used every resource we had within the Participants' organizations – they educated us and we educated them
 - HIM departments
 - In-house counsel
 - Privacy officers
 - Security officers

The Privacy and Security Work Group (early in their work) created a list of “issues” to be addressed

- ↕ State laws related to certain data and how it is to be treated
 - HIV
 - Behavioral health
 - Substance abuse
 - Correctional facilities
 - Etc.
- ↕ Does the patient have to consent for data sharing?
- ↕ Who will have access to the data?
- ↕ Does the (care) setting matter?
- ↕ HIPAA interpretations – do we have to agree?
- ↕ What do we need to audit and track?
- ↕ Who should have access to the audit?
- ↕ What rights does the patient have under the law?
- ↕ What rights should the patient have beyond the law?

The Privacy and Security Work Group approached the issues in a number of ways

- ◊ We talked with our peers and colleagues throughout the state and around the country
- ◊ We restricted the data use to “diagnosis and treatment” in the Emergency Department setting
 - This gave us a concrete “it”
 - Our scenarios became more real because we could discuss how this system would fit practically into the workflow
- ◊ We educated ourselves on HIPAA
 - We tried to reconcile all the consent processes in the community but quickly decided to focus on the Notification process instead
- ◊ We identified where HIPAA was not enough
 - The WG felt strongly that Patients’ Rights could not be bound by HIPAA
 - An Opt-out model was defined

The Privacy and Security Work Group approached the issues in a number of ways

- ◊ We defined a community standard that all sites would notify patients that their data will be shared
- ◊ We didn't require all participating sites to notify patients the same way
- ◊ We developed a Fact Sheet to be used by all organizations for patient education about the MidSouth eHealth Alliance
- ◊ Security was addressed separately from Privacy
 - Addressed by policy and technology
- ◊ Audit logs were deemed to be critical to success in monitoring both security and privacy issues
 - Audit logs from the exchange work in concert with site audit logs
 - We have automated flags that trigger for certain conditions
 - We continually update the audit process to support site use

MidSouth eHealth Alliance legal agreements that are in place

- ◆ BAA between each of the Participants and Vanderbilt (Vanderbilt is a BA in this situation)
 - This was enough for us to start. All the attorneys were comfortable with Participants sending data to Vanderbilt to build the system.
 - The challenge was how to exchange data in a framework that was legal and protective
- ◆ All Participants “apply” to be a member of the exchange through a Registration Application that once it is accepted and countersigned becomes the Registration Agreement.
- ◆ All Participants must sign the Participation Agreement which is the “data sharing contract”.
- ◆ All Participants have a voice/vote on the Operations Committee which sets policy direction.
- ◆ All of these documents are publically available at www.regionalinformatics.com
- ◆ Core concepts that flow through all documents:
 - Data ownership is maintained by the publisher.
 - It is irrelevant where it is stored. They are responsible for the quality.
 - What is important is how the data are used and by whom.
 - Any Participant with the appropriate notice can “leave with their data”

Today's approach to privacy, consent and notification

- ▶ **Participants in the MidSouth eHealth Alliance –**
- ▶ maintain the relationship with the patient
- ▶ control how the data will be used
- ▶ determine what data will be shared (or not shared) and disclose this to all Participants
- ▶ are responsible for authorizing users
- ▶ are required to notify patients through the Notice of Privacy Practices or an acceptable alternative that their data will be shared
- ▶ must have a mechanism in place to respond to a patient's request to not participate in data sharing
- ▶ coordinate and respond to a patient's request for information about who has viewed their health care data within the Participant's setting and through the MidSouth eHealth Alliance

- ▶ **The MidSouth eHealth Alliance posts a FACT sheet on its website in addition to the notification process that takes place at the point of care**

What is the MidSouth eHealth Alliance?

Certain health care providers in the Memphis area share health information through the MidSouth eHealth Alliance (the Alliance). The Alliance is a community wide information system that helps health care providers in the treatment of patients. Providers are doctors, nurses, healthcare workers, hospitals, and clinics.

Which organizations in the MidSouth eHealth Alliance share information?

The following organizations now participate in the MidSouth eHealth Alliance:

- Baptist Memorial Hospital - Collierville
- Baptist Memorial Hospital for Women
- Baptist Memorial Hospital - Memphis
- Baptist Memorial Hospital - Tipton
- Christ Community Health Services
- Memphis Managed Care/TLC
- Methodist Healthcare including LeBonheur
- Children's Medical Center
- Saint Francis Hospital - Memphis
- Saint Francis Hospital - Bartlett
- St. Jude Children's Research Hospital
- The Med
- Health Loop Clinics
- UT Medical Group, Inc.

Why is health information shared?

Health care providers can make better choices about a patient's care and treatment when they have as much information as possible about that patient's health from lab tests, medical history, medicines, and other reports. The Alliance permits providers to review medical information in a system that is faster than contacting a patient's other providers one by one. The Alliance only shares information about a patient's medical condition with health care providers currently involved in that patient's care.

Is shared health information kept private and confidential?

Yes. The Alliance obeys all applicable federal and state laws about privacy of medical information. The Alliance will not share health information with anyone not involved in the care of a patient or related to operations of the Alliance. Every organization and provider that shares or uses information from the Alliance must obey strict rules for security and privacy.

What are your rights?

As a patient, you have the right to not share your health information in the Alliance. This is called "Opting Out." However, if you choose to opt out, health care providers may not have access to health information that may be important and useful in making choices about your medical care.

If you have questions regarding your privacy rights, please refer to the Notice of Privacy Practices provided to you by your health care provider. If you need another copy of that Notice, please ask your provider to give you one. This Fact Sheet is intended for educational purposes only. Operations of the Alliance and the content of this Fact Sheet may be changed by the Alliance from time to time without notice.

Who do I contact for more information?

Every organization in the Alliance has a person who is responsible for privacy. When you have a question, ask for the Privacy Officer. He or she will be able to answer your questions or find someone who can help you.

Today's approach to privacy, consent and notification

- ▶ **Patients who seek their care from Participants in the MidSouth eHealth Alliance –**
- ▶ are notified that their clinical data could be shared with the MidSouth eHealth Alliance
- ▶ each organization has a contact person to discuss concerns. The contacts are known to all Participants and shared with patients in the Notice of Privacy Practices and the FACT sheet
- ▶ have the right not to share their data from specific institutions
- ▶ patients do not have access to the system; however, they have a right to request an accounting of disclosures per the policies
- ▶ patients cannot amend their data through the exchange but can under existing law and policies work with the Participants to amend or change health information in their record
- ▶ **Patient data are either accessible or not accessible (all or nothing)**
- ▶ We do not allow episodic or disease specific “opt out”

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The MidSouth eHealth Alliance has a number of policies. These are reviewed and revised as needed but at a minimum annually

◆ Registration Policy

◆ Registration Policy (contains form of Registration Application/Agreement)



◆ Enrollment Forms

◆ Alliance Confidentiality Statement and Policy

◆ Secure ID Request Form

◆ Terms of Use Form

◆ User Set Up Information Chart



◆ Governance Policies

◆ Policy on Policies and Procedures

◆ Coordination of the Alliance Policies and Participants' Policies

◆ Privacy and Security Policy

◆ Conditions to be Met Before a New Data Provider's Data May be Used

◆ Roles and Responsibilities

◆ User Access

◆ Auditing and Reporting

◆ Mitigation

Current process of navigating the privacy and confidentiality issues

- ⚡ Following the Connecting for Health policy framework and model contracts, the board created the Operations Committee
 - All Participants have a voice/vote in addition the MidSouth eHealth Alliance has a voice/vote
- ⚡ The Operations Committee has become the forum for discussing the privacy, security, confidentiality and legal landscape. They advise and educate the Board and others.
 - Reviews and recommends policy changes
 - Reviews requests for different uses of the data
 - Reviews applications for participation
 - Responds to specific agenda items from the Board – usually related to policy
- ⚡ The Operations Committee is involved in the ‘expansion of scope and use of data’ discussions
 - Expansion of scope beyond the emergency room
 - Ambulatory sites
 - Hospitalists
 - Expansion of use of the data – future
 - Public health reporting
 - Reportable diseases
 - De-identified/Anonymized data for epidemiology studies
 - Case management

We don't pretend to know what the future will bring but we do our best to educate ourselves on what is happening

- ▶ To date, our experience has been that consensus at the local level is more important than waiting for consensus to be achieved at a national level.
- ▶ We do not believe that the decisions we make today are permanent; however, we have the infrastructure in place to respond.

The screenshot shows the MidSouth eHealth Alliance website. The header features the logo and navigation links for Home and FAQ. A central banner displays a group of hands reaching together, with the text "Connecting Healthcare" and "MidSouth eHealth Alliance is working for you." To the right is a login form with fields for User ID, PIN, and Token, and a Submit button. Below the banner is a "Welcome" section with a brief description of the organization's mission. A "Participants" section lists logos for Baptist Memorial Health Care, Memphis Managed Care, The Med Regional Medical Center at Memphis, and Saint Francis Hospital. A "Special Announcement" section mentions a partnership with HIMSS and other organizations. A "Fact Sheet" section provides a link to download a PDF document.

Technical Review of HIE Components

The MidSouth eHealth Alliance in Memphis

Funding: AHRQ Contract 290-04-0006; State of Tennessee; Vanderbilt University.
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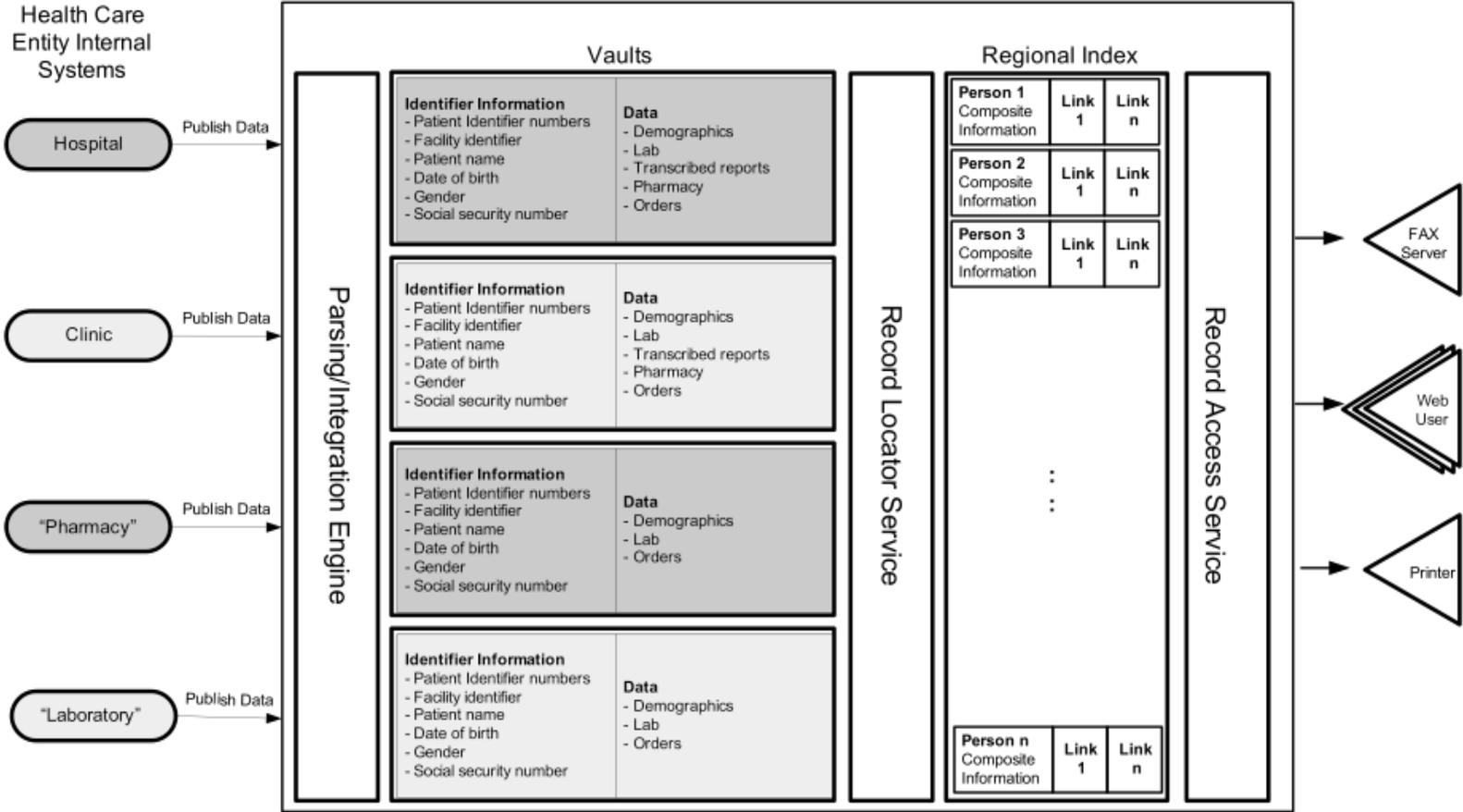
Underlying Architecture for the Memphis HIE

- ↕ Infrastructure
 - Data storage – Flat File structure
 - Little tagging
- ↕ Data Handling
 - Record Linking Algorithms
 - Data Transport
 - Data Parsing
 - Data Types
 - Data QA/Correction/Clean-up/Hiding documents
 - Merge Records
- ↕ Opt Model
- ↕ Data Presentation Layer
 - System Access and Use
- ↕ Security
- ↕ Auditing

Underlying principle was and continues to be “low cost, low barrier to participate”



The data are centralized but separated in logical vaults. The publisher of the data retains ownership and is responsible for the quality. The data is not co-mingled in aggregate. Patient record viewing is done one patient at a time with data from all sites who have sent data on the patient.



Site Connectivity and Data Transport

Connectivity Survey

System Specific
What platform does the your application run on? (Windows, Linux, Solaris, etc)
What format types are available for exporting of results? (ASCII, PDF, CSV, HL7, etc)
What products/systems do you run?
What transfer methods does your system support? (FTP, SFTP, HTTP, HTTPS, special socket connect)
Can your system support DNS names?
Networking
Is your system protected by a firewall? If so, what is the product?
Is your system behind a private network?
Does your site have a VPN? If so, what vendor?
VPN/Networking Resource Name and Contact Information
Technical Application Resource Name and Contact

- Most data feeds are sent via firewall-to-firewall VPN connections
- FTP Jailed accounts
- Dependent on site's network
- Work with each site to determine their best method of data transfer



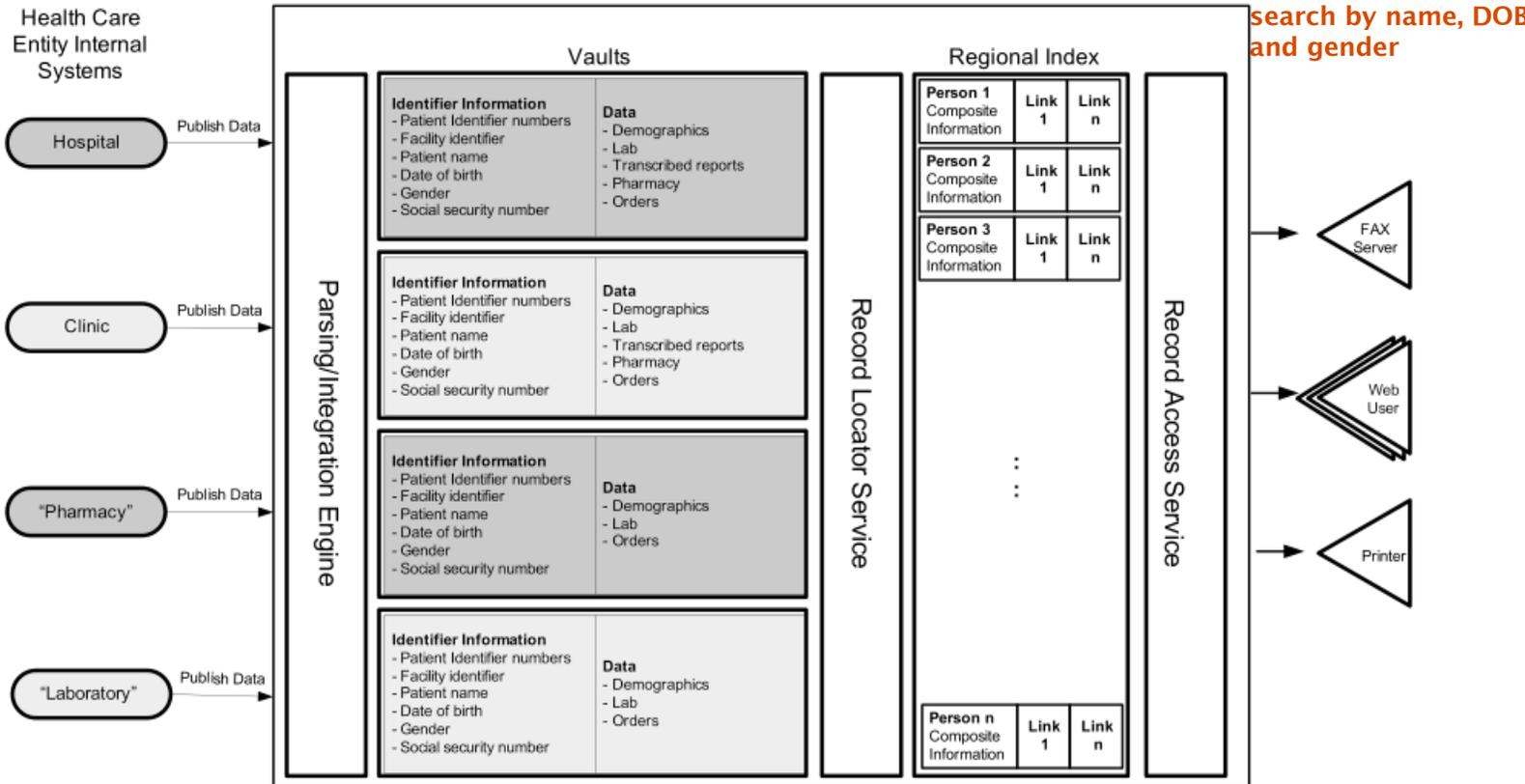
Algorithms determine when records are inserted, updated & linked

1. Algorithm inherent to Oracle here to check if patient has previous records

2. Algorithm active here to match PID to clinical record

3. Algorithm active here to create linkages of site records to RHIO RPI

4. Algorithm active here to allow sites to search by name, DOB and gender



Data is published from data source to the exchange
Participation Agreement
Patient Data
Secure Connection
Batch / Real-Time

Exchange receives data & manages data transformation
Mapping of Data
Parsing of Data
Standardization of Data
Queue Management

Organizations will have a level of responsibility for management of data
Issue Resolution
Data Integrity
Entities are responsible for managing their Data

Data bank compiles and aggregates the patient Data at the regional level
Compilation Algorithm Security
Authentication User Access

Record Linking Process

↕ Current Record Linking Algorithm

- Deterministic
- Hand-constructed decision tree based on
 - SSN (edit distance)
 - Name (LCS and phonetic encoding)
 - Date of Birth
 - Gender

↕ Moving to probabilistic matching

- Should reduce false negatives but will likely increase false positives
- Core Feligi-Sunter algorithm with parameter tuning currently in test at Tenn Tech University
- Working to move it to host at Vanderbilt where preprocessors will be added to clean data and post processors will be designed to remove false positives



Algorithm Evaluation

↕ Random sampling

- Periodic manual review of 10,000 to 25,000 randomly selected matches (linked records)

↕ Graph-based evaluation

- Build a set of graphs in which each record is a node and each link is a vertex
- Group resulting graphs into the following categories:
 - Trivial cliques with only 2 nodes
 - More complex cliques with 3 or more nodes
 - Non-clique graphs

↕ Comparative evaluation

- Review all matches removed and added by a proposed change to the algorithm (tweaking)

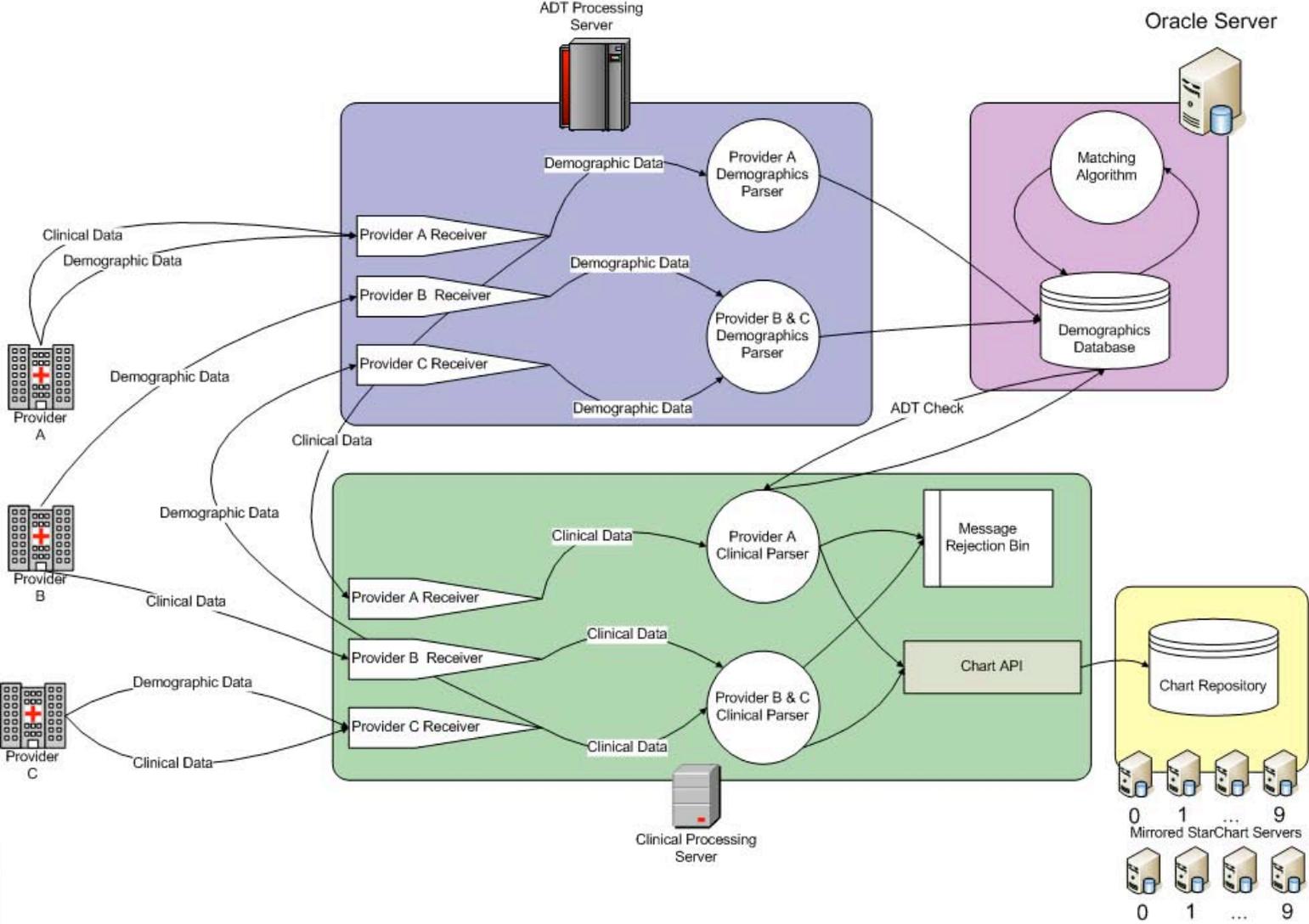


Algorithm Evaluation –Issues identified

- ↕ Very few clear cases of false positives
- ↕ Issues identified include:
 - Data quality issues with source systems
 - Much of review involves first pass by us with follow-up at data source sites
 - Records that should not be sent to the RHIO
 - Work to eliminate those feeds (any naming convention that uses non traditional names)
 - Potential identity theft
 - Next algorithm revision will note potential cases of id theft in the log files

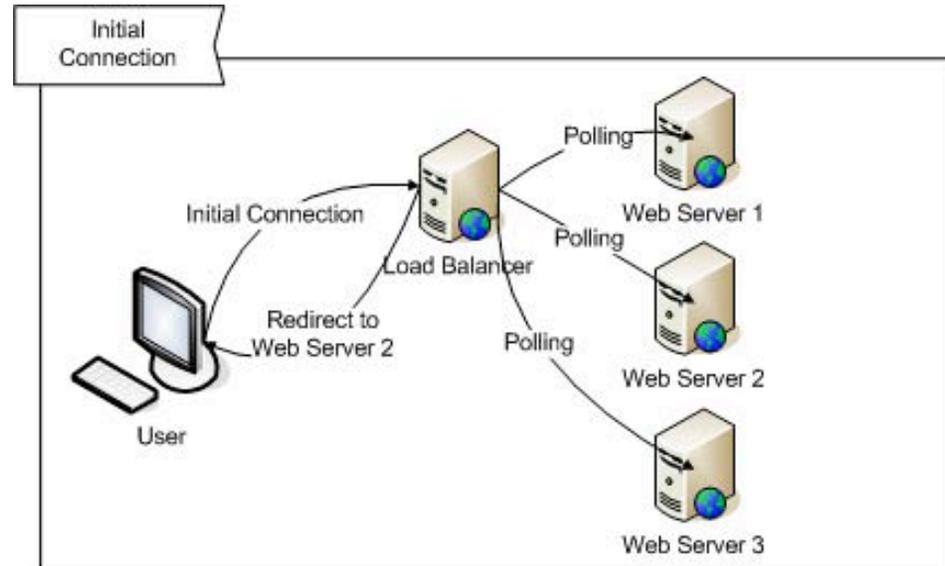


The Regional System – Data Feeds – Backend View

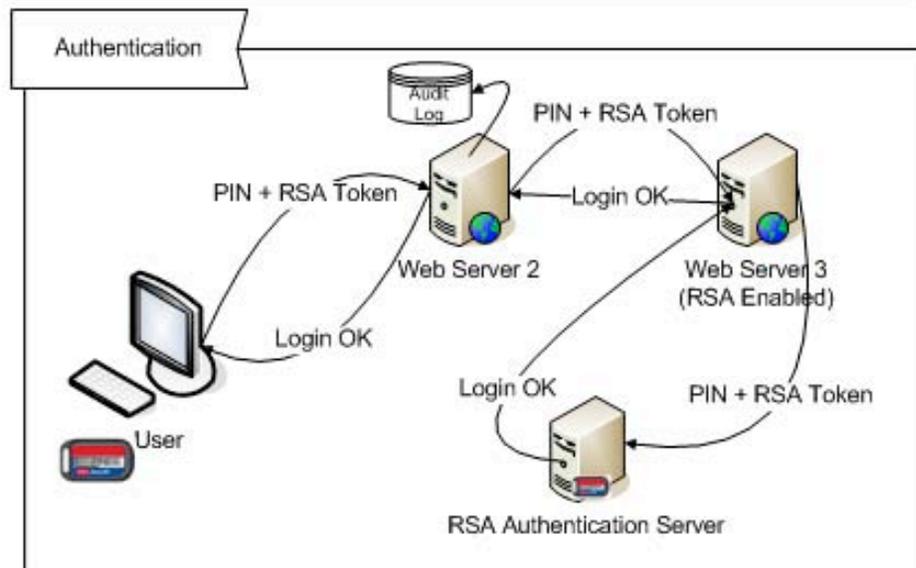


we have two levels of access: the first is through a Record Locator Service which reveals a minimum amount of patient information. The second is access to the clinical information about a specific patient

Connecting from user's site via the Internet

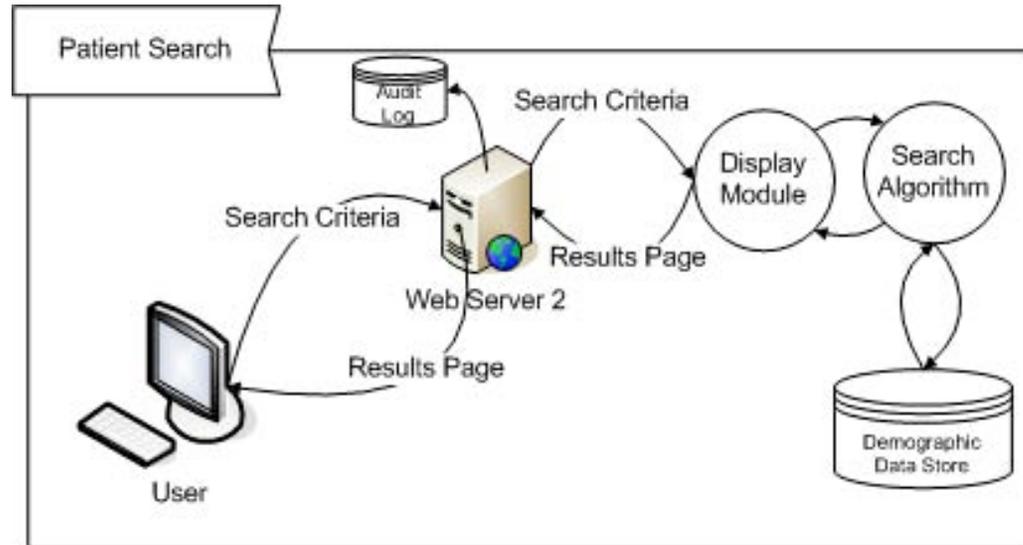


User authentication using 2-factor security

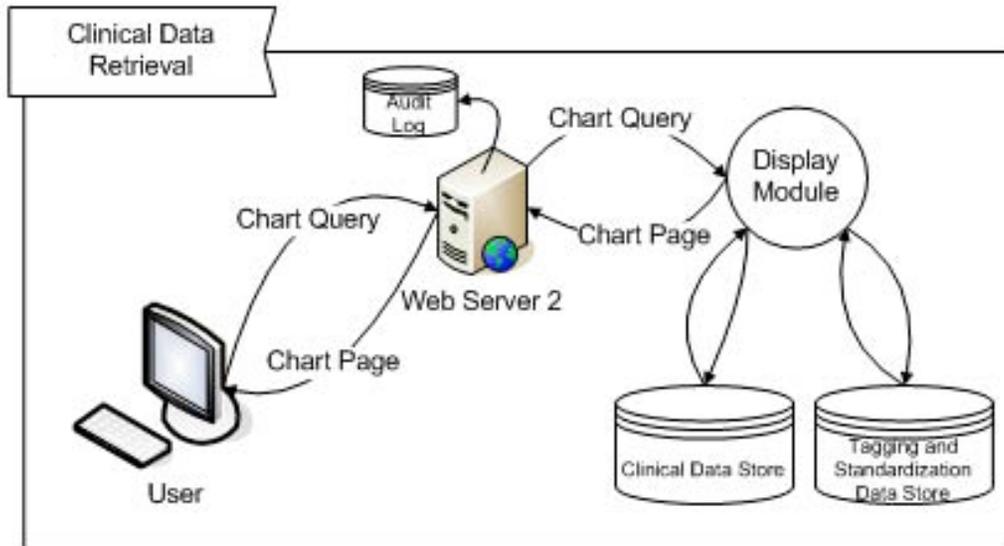


User Functions

Patient
Look-up



Clinical
Results
Review



Data Inputs/System Additions

Demographic, Encounter and ICD/CPT Data

- HL7 standard PID data version received from sites
- Demographic parsers written in COBOL
- Parsers run on Unix-based mainframe application
- Non HL7 incoming data is mapped to HL7 2.4
- Merged Records table
- Record Link table
- Audit trails



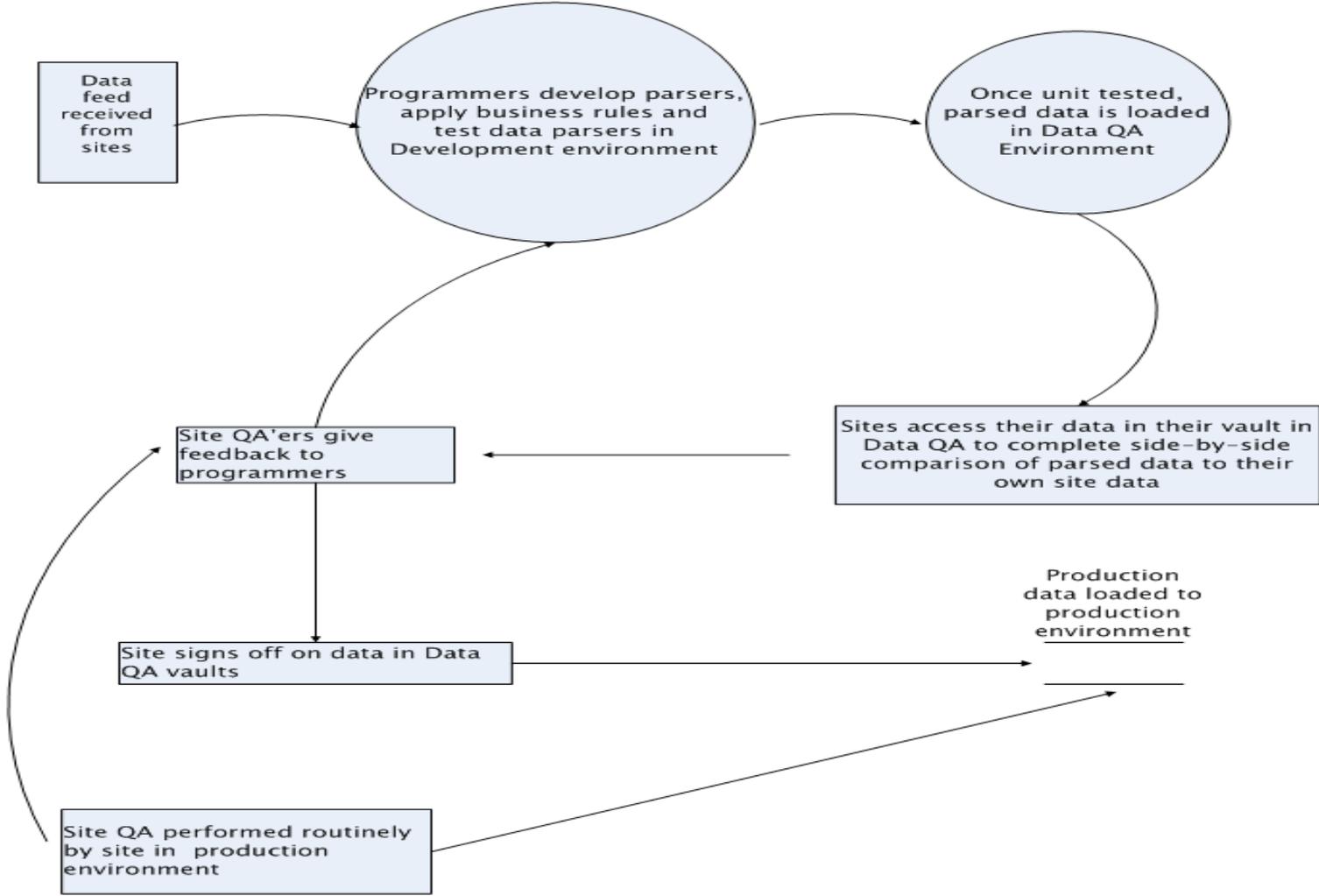
Data Inputs/System Additions

Clinical Data:

- Maintain HL7 standard of incoming data
- ICD9 batch files standardized to HL7 2.4
- Clinical parsers are written in Perl
- Text reports are HTML (most commonly)
- XML data in some instances
- Matched against demographic records
- Reject Bin/Re-process
- LOINC assignments at presentation layer



Data Quality Review Process



RHIO In/Out flag

StarPanel - king94k (King, Janet K) - Microsoft Internet Explorer

Address: https://startest2.mc.vanderbilt.edu/cgi-bin/vehiDemo/secureid.cgi

User king94k (King, Janet K) StarPanel Lite V1.5.6 [connected to DEMO database]

Clinical Labs Calendar Encounter ClaimRx Demographics Print Summary

View All Chem Blood Gas Heme Micro Other Labs Cardiac Rad Disch. Summ. Other Notes Claims Misc.

2007
08/21/07 Claim: Claim Rx History [TLC]

2006
09/12/06 Other Lab: Labs [Methodist]
08/24/06 Radiology: Ct Spine Cerv W/O Contrast [BMHCC-Mem]
08/22/06 Radiology: Chest Pa/Lat [BMHCC-Mem] Cervical Spine Minimum 4 Views [BMHCC-Mem]
08/04/06 Discharge Summary: Discharge Summary [MED]
07/21/06 Chemistry: Labs [Methodist]
Hematology: Labs [Methodist]
Other Lab: Labs [Methodist]
06/17/06 Chemistry: Labs [Methodist]

Full Demographics: Back

Site	MRN / DOS	
<input checked="" type="checkbox"/> BMHCC-Coll	0000030005 18-OCT-06	
<input checked="" type="checkbox"/> BMHCC-Mem	0000010007 No DDS	
<input checked="" type="checkbox"/> BMHCC-Wom	0000020005 13-JUN-06	
<input checked="" type="checkbox"/> MED	M000010005 No DDS	
<input checked="" type="checkbox"/> Methodist	10005 18-DEC-06	
<input checked="" type="checkbox"/> TLC	XXXXX1000105 No DDS	

View Selected View All

Security and Admin
Audit Log Report

Address: https://startest2.mc.vanderbilt.edu/cgi-bin/vehiDemo/vehi_chrono.cgi?i:#

Internet

Full Demographics details:
 Site: Baptist Collierville: 0000030005 RHIO OUT
 Name: VEHI, JESSICA L
 DOB: 02/03/1954 - 54YO
 Gender: F
 Race: B
 SSN: XXX-X3-5640
 Patient Address: 353 VIRTUAL ST VIRTUALTOWN TN 99999-0000
 Phone: (731)555-1234
 Date of Service: 18-OCT-06

User access: www.midsoutheha.org



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MIDSOUTH eHEALTH ALLIANCE Home FAQ

Connecting Healthcare
MidSouth eHealth Alliance is working for you.

Log In

USER ID:

PIN: TOKEN:

Your PIN +  RSA SECURITY

Welcome

MidSouth eHealth Alliance (MSEHA) is a non-profit initiative to improve the quality, safety, and efficiency of health care. By providing an electronic exchange of health information, physicians can securely access vital information when and where it is needed.

Participants

SPECIAL ANNOUNCEMENT

The Tennessee chapter of the Health Information & Management Systems Society (HIMSS), in partnership with QSource, THA, THIMA, TMGMA, TMGMA and Shared Health, is working with the Tennessee eHealth Advisory Council to improve the quality of health care available across our state.

[Click here to find more information](#)

Fact Sheet

 What is the MidSouth eHealth Alliance? Who is participating? You can download a Fact Sheet that answer the most frequently asked questions about the initiative.

[Click here to download the Fact Sheet](#)

Search methods vary by participating user site

RECENT ED REGISTRATIONS at Methodist University Hospital

DOS	MRN#	Lastname, Firstname	Total Encounters at:	
			MI Date	Other Sites
02/19/2008 02:11 PM	10005	VEHL, JESSICA	2	5
02/19/2008 02:11 PM	10005	PATIENT, DEMO	1	matching
02/19/2008 02:11 PM	10005	PATIENT, BHO	4	matching
02/19/2008 02:11 PM	10005	PATIENT, EHEALTH	12	40

Security and Admin
Audit Log Report
Operation Report

We are pleased to announce that Health Loop data from 2-1-2008 is now available!

DISCLAIMER
The information retrieved on the MSelHA web portal or via printed report is for **reference purposes only**. The information does not constitute a complete medical record. The information is to only be used for the purposes of treatment and diagnosis. All treatment decisions and the consequences and outcomes thereof, are the responsibility of the health care provider and patient.

Data Available By Site:

Epstein Memorial Health Care Corporation
Timing: 24 hour batch reports
Sites: Memphis, Women's, Tipton, and Collierville
Data Types: Patient Demographics, Encounter data, Lab Results, Radiology/Imaging Results, Dictated Reports (Discharge Summary, Operation Reports, Cardiology Reports) Dictated reports are **PRELIMINARY AND UNAUTHENTICATED**, ICD9 CM codes

Tenet Hospitals
Timing: Real-time
Sites: Saint Francis and St/Bartlett
Data Types: Patient Demographics, Lab Results, Radiology/Imaging Test Results, ICD9 CM codes

Methodist Healthcare

ED Recent Registration screen was developed 9 months post initial use

Search by MRN/site, SSN or Name

Patient Search

Name: JESSICA
DOB: 02/03/1954
Gender: Female

Search Performed at: 10:19:29 CST 02/19/08

Please use the plus, minus and hide button to toggle your selection.

MRN	NAME	DOB	SEX	SSN	SITE	DOS
0000020005	JESSICA L VEH	02/03/1954	F	XXX-X3-5640	Baptist Women	06/13/2006
0000010007	JESS L E-HEALTH	02/03/1954	F	XXX-X3-5640	Baptist Memphis (East)	X
0000020005	JESSICA L VEH	02/03/1954	F	XXX-X3-5640	Baptist Collierville	10/28/2006
10005	JESS VEH	02/03/1954	F	XXX-X3-5640	Methodist Healthcare	12/18/2006
XXXX1000105	JESSICA K VEH	02/03/1954	F	XXX-X3-5640	AmeriGroup / TLC	X
M000010005	JESSICA V VEH	02/03/1954	F	XXX-X3-5640	The Regional Medical Ctr	X

Security and Admin
Audit Log Report
Operation Report

LOINC mapped labs & lab panels improve the display of the data

StarPanel - king94k (King, Janet K) - Microsoft Internet Explorer

Address: https://startest2.mc.vanderbilt.edu/cgi-bin/vehidemo/secureid.cgi

User: king94k (King, Janet K) StarPanel Lite V1.5.0

Clinical Labs Calendar Encounter ClaimRx Demographics Print Summary

Labs: By Category

- Chem: Blood Gas
- Heme: Micro
- Other Labs: Cardiac

Labs: By Panel

- CMP, HEP, Lipids, CBC
- PT/INR, ABG, UA, BMP

0000010005 [BMHCC-Mem-TEST] VEHI, JESS L (02/03/1954 - 53YO F) Print Back

CMP (Comprehensive Metabolic Panel) [Graph]

*Indicates that the standardized test code mappings have not yet been confirmed by the source system. View the original result by clicking lab values.

Date	Facility	Alb	Alk	Phos	ALT	Anion	Cap	AST	Bilirub	BUN	Ca	Cl	CO2	Creat	Gluc	K	Na	Prot
08/23/06 03:40	BMHCC-Mem-TEST	-	-	-	11	-	-	13	8.6	106	27	0.8	117*	4.2	140	-	-	-
07/21/06 21:47	MH-South-TEST	4.4	72	25	9	25	0.9	10	9.4	105	23	1.3	115	3.8	137	8.6*	-	-
06/17/06 18:15	MH-South-TEST	4.1	69	19	10	29	0.6	12	8.5	103	21*	1.1	88	4.8	134*	7.7	-	-
06/14/06 11:41	BMHCC-Mem-TEST	-	-	-	10	-	-	22*	9.2	100	35*	0.8	82	3.5	141	-	-	-
06/09/06 13:00	BMHCC-Mem-TEST	3.2*	103*	32	-	19	0.3	20	9.5	101	34*	1.0	137*	3.6	142	6.4	-	-
05/23/06 13:25	BMHCC-Wom-TEST	4.0	78	33	-	14	0.3	10	9.3	104	28	0.9	98	5.0	140	7.4	-	-
05/21/06 17:25	MH-South-TEST	4.1	76	21	4*	20	0.5	12	9.1	107	26	1.0	108	4.0	137	8.1*	-	-
05/11/06 04:25	BMHCC-Coll-TEST	2.9*	79	35	-	11*	0.52	6*	8.2	111*	31	1.0	99	4.2	145	5.8*	-	-
05/10/06 06:45	BMHCC-Coll-TEST	3.7	98	45	-	14*	0.55	14	9.1	108*	26	0.9	90	3.6	145	7.8	-	-
03/17/06 08:42	MED-TEST	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0*	-	-	-
03/17/06 00:08	MED-TEST	-	-	-	5.0	-	-	11*	9.0	102	31	0.9	125*	5.2*	138	-	-	-
03/16/06 06:39	MED-TEST	3.6	93	18	8.0	24	0.4	6*	9.4	101	29	0.8	166*	4.7*	138	7.7	-	-
03/15/06 18:13	MED-TEST	-	-	-	4.8	-	-	8	8.3*	99*	30	1.0	240*	2.8*	134*	-	-	-

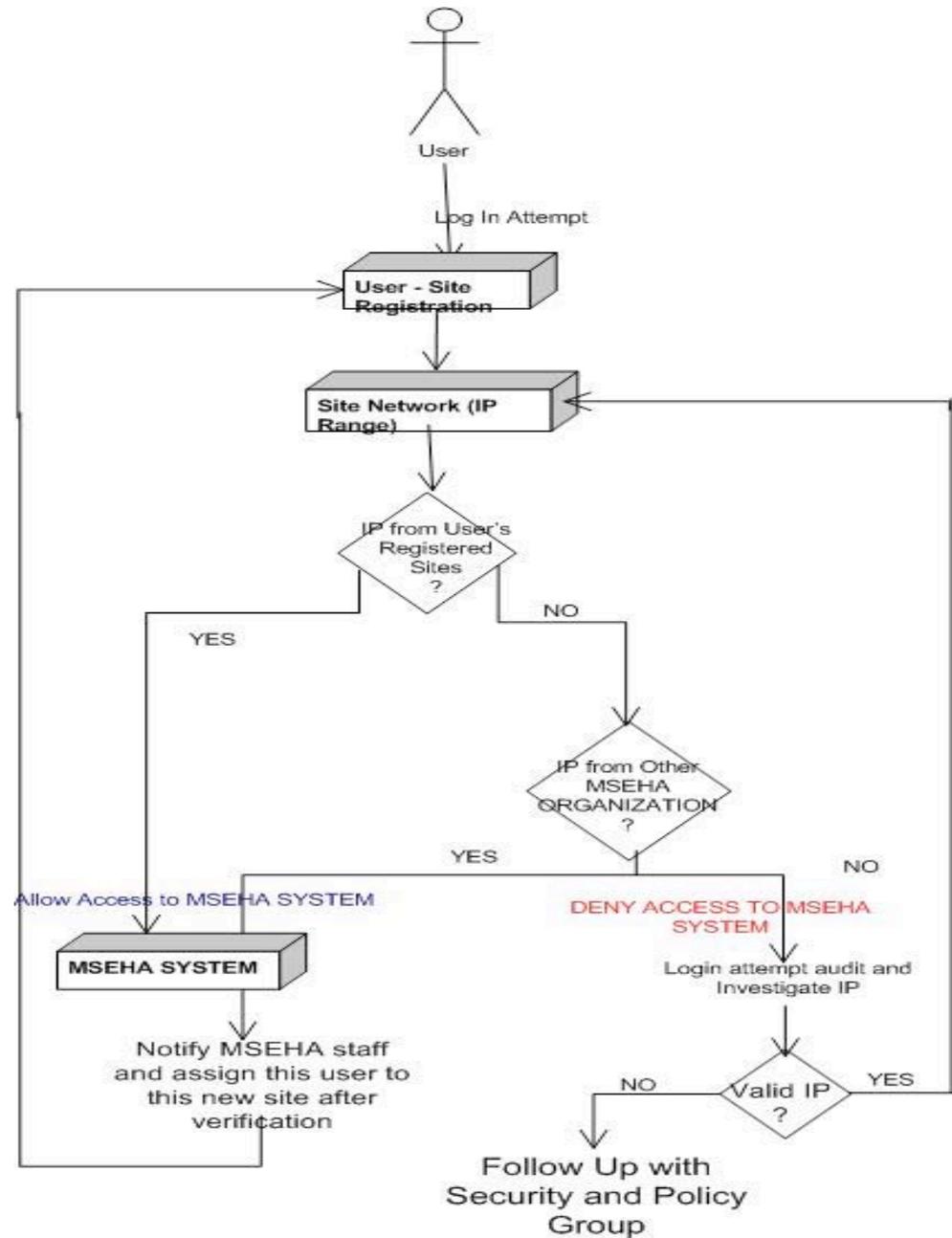
Hover over values for units, reference ranges, and comments. Click values to see the original battery from the source. Click column headers to graph. **Color Key:** Has Comment, Abnormal, Lab Result Linked From on Previous Page

User Access by Secure Token



- ⚡ The SecurID Token is an authentication device, the use of which is subject to the terms and conditions described in the MSeHA Confidentiality Agreement and the Terms of Use on system access
- ⚡ The SecurID token generates a simple one-time authentication code that changes every 60 seconds
- ⚡ Dual-factor security: something you have, something you know

MSeHA User access limited by IP address



Auditing Access and Use

Audit Data

- Each user's access: Patient's searched, returned records, records viewed, documents viewed, log-in activities
- All updates and inserts are recorded for demographic and clinical data
- IP addresses from users' sites are audited
- User Access is to a single patient record at a time
- Audit and Use reports created and made available to participant Privacy and Security staff
- Auditing, access and monitoring policies are supported.
- Policy defines use of the data to be for "diagnosis and treatment only" at this time

↕ Sustainability



Cost savings are not enough

- ↕ From the Memphis experience, cost savings will not sustain the HIE. Current incentives do not encourage reducing costs. In its May 2008 report, Evidence on the Costs and Benefits of Health Information Technology, the CBO states...

“health care financing and delivery are now organized in such a way that the payment methods of many private and public health insurers do not reward providers for reducing costs – and may even penalize them for doing so.”

“An increased capability to exchange information is not sufficient, however, to reduce costs and improve the quality of health care because existing mechanisms for paying providers do not create incentives to reduce costs by acting on that information.”



Estimated Savings from HIE in Memphis, TN

Initial Projection

Potential reduction (\$,000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Lower ED expenditures	\$ -	\$ 115	\$ 575	\$ 1,724	\$ 2,068	\$ 4,482
Decrease # of duplicate lab tests	-	96	956	956	1,435	3,443
Decrease # of duplicate rad tests	-	299	1,493	2,986	2,986	7,764
ED communication/distribution	-	-	86	86	103	275
Reduced inpatient admits	-	56	699	1,397	2,096	4,248
Total potential reduction	\$ -	\$ 566	\$ 3,809	\$ 7,149	\$ 8,688	\$ 20,212

Experience thus far

Potential reduction (\$,000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Lower ED expenditures	\$ -	\$ 15	\$ 91	\$ 91	\$ 91	\$ 288
Decrease # of duplicate lab tests	-	4	25	25	25	79
Decrease # of duplicate rad tests	-	15	87	78	78	258
ED communication/distribution	-	-	-	-	-	-
Reduced inpatient admits	-	20	120	120	120	380
Total potential reduction	\$ -	\$ 54	\$ 323	\$ 314	\$ 314	\$ 1,005

While savings may provide some cost offset, it will **not** pay for the exchange.

Sustainability Strategies

- Develop a revenue stream that includes a combination of the following:
 - Seek grants as seed money
 - Identify segments of the population where government benefits from the system (e.g. Medicaid, uninsured/safety net, employees)
 - Identify non-government payers (large payors, self-funded employers and health plans)
 - Provider participation fees



Sustainability Strategies

- Business plan is helpful
- Goal is to have those that benefit, pay in proportion with benefit
- Areas of potential benefits to payors and employers:
 - Disease management (e.g. Diabetes, asthma)
 - Specific populations (e.g. Obesity)
 - Pain management
 - Workman's compensation
- Ask 'What is the marginal benefit to society and what is the marginal cost to provide?'



Questions?

Lessons Learned

- Get Production data from the contributing sites as early as possible
 - Standards such as LOINC and SNO-MED are not required initially, but can be incorporated over time
 - Different access control measures as defined by user roles
 - First data feed receipt to permanent storage and initial use took approximately one year in this project
 - Don't expect to have a complete and finite list of data elements to collect, store and share. Plan to store as much data as possible as early as possible
 - System should be flexible enough to be used in various workflows
 - Need an infrastructure that will support flexible ad hoc queries to support a value model and business purpose
 - Accept the fact that all questions regarding the development and operation of the exchange won't have answers at the onset
 - Flexibility and adaptability are key to the development/start-up process
 - Can have early wins at a low cost for participants
- 