

Indiana Health Information Exchange: April 2006 Overview

Illinois e-Health Records Taskforce
Conference Call April 10, 2006

Thomas P. Penno
Chief Operating Officer
Indiana Health Information Exchange



Indiana Health Information Exchange



Founded in 1969 by Sam Regenstrief

Affiliated with IU School of Medicine

~\$12M annual budget largely from federal grants

Pioneers in medical informatics

Standards: HL7, LOINC

EMRs: RMRS, INPC



Founded in 1999 by 50 community physicians – Central Indiana Coalition to Reinvent Health Care

Early seed funding from Health & Hospital Corporation of Marion County

Initiated community clinical messaging concept



Founded in 2002 by the Central Indiana Corporate Partnership

Economic development organization promoting academic/industry collaboration in life sciences

Initial Organizations and Board

- Biocrossroads - CEO
- City of Indianapolis - Mayor
- Clarian Health Partners - CEO
- Community Health Network - CEO
- Health and Hospital Corporation – CEO *
- Indiana State Department of Health - State Health Commissioner *
- Indiana State Medical Association - President
- Indiana University School of Medicine - Dean
- The Indianapolis Medical Society - President
- Marion County Health Department - Chief Medical Officer *
- Regenstrief Institute - CEO
- St. Francis Hospital and Health - CEO
- St. Vincent Healthcare - CEO
- At large (2) * *

* Former ICC Board Members

Our Vision

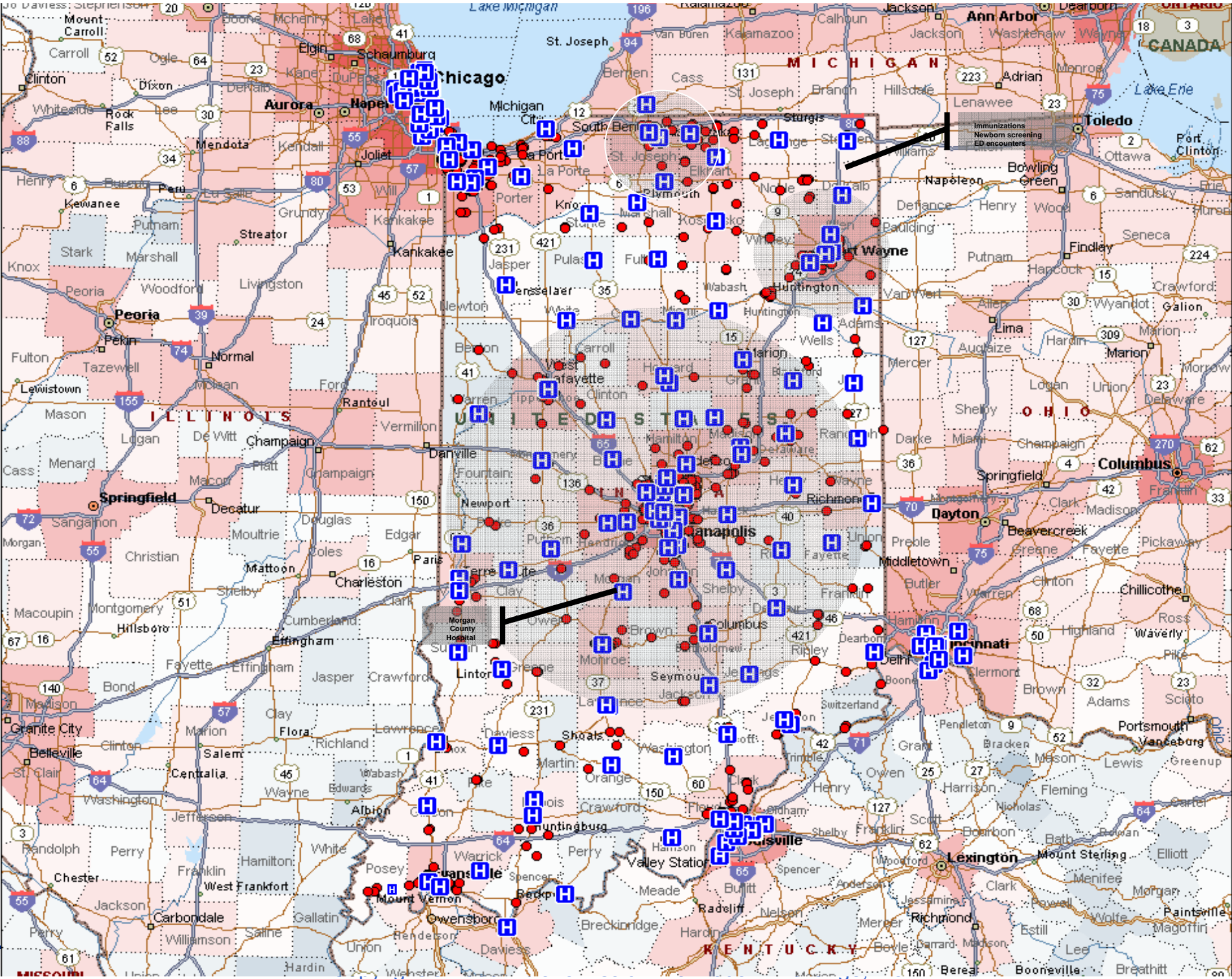
- The Indiana Health Information Exchange (IHIE) is a non-profit venture backed by a unique collaboration of Indiana health care institutions. Our vision is to use information technology and shared clinical information to:
 - Improve the quality, safety, and efficiency of health care in the state of Indiana,
 - Create unparalleled research capabilities for health researchers,
 - Establish a model of health information exchange for the rest of the country.

Indianapolis MSA, Indiana

- 12th largest city in U.S.
- 1.7 million population base
- Referral center for much of the state (7 million)
- Home to Indiana's only medical school
- Regenstrief Institute, Inc.
- Competitive hospital environment
- Minimal managed care

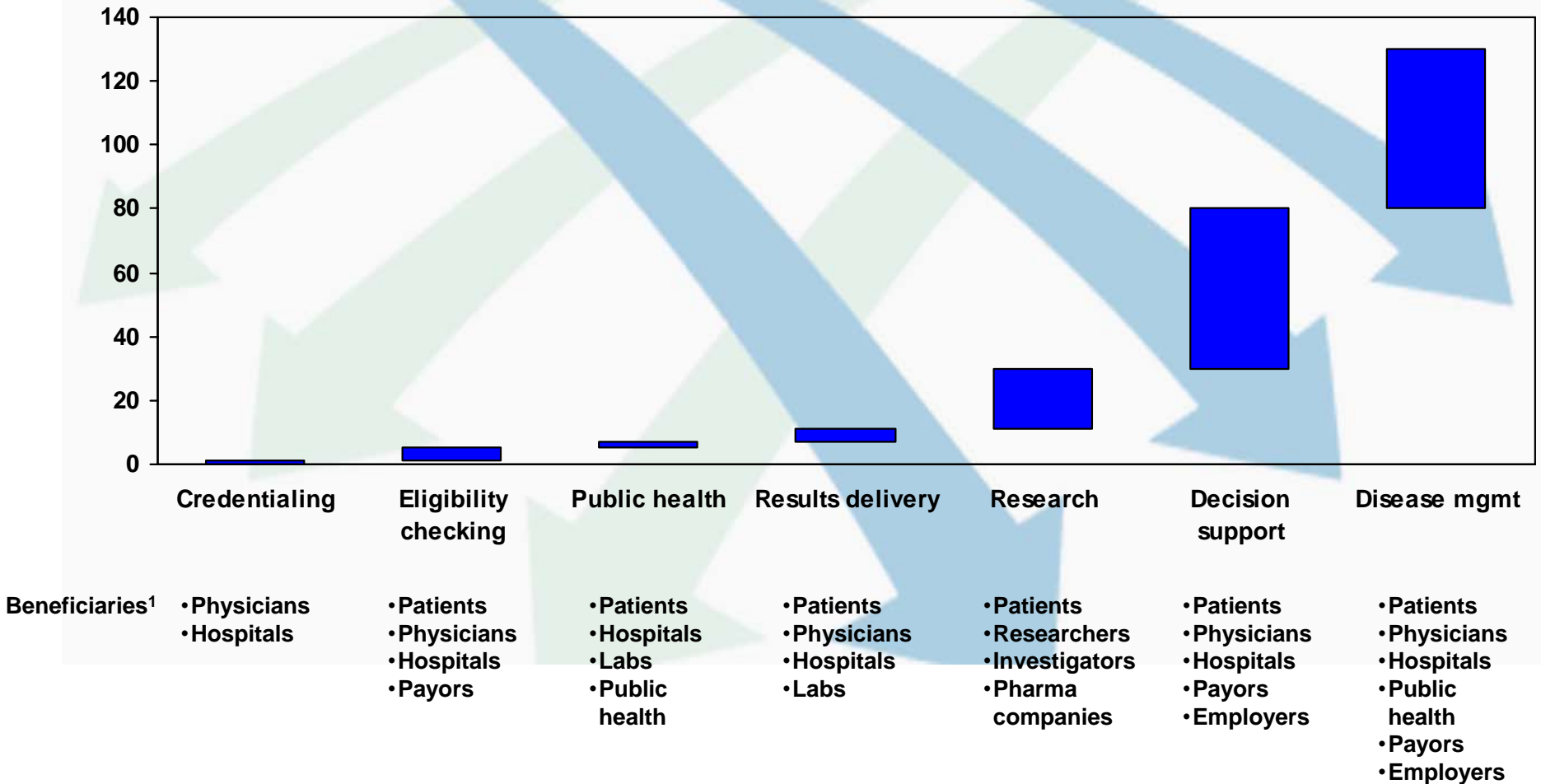


Indiana Health Information Exchange



Benefits Accrue to Stakeholders Across System

Annual economic value (\$M)



(1) Includes quality of care/other non-economic beneficiaries as well

Benefits Accrue to Stakeholders Across System

Annual economic value (\$M)



Beneficiaries¹

- Physicians
- Hospitals

- Patients
- Physicians
- Hospitals
- Payors

- Patients
- Hospitals
- Labs
- Public health

- Patients
- Physicians
- Hospitals
- Labs

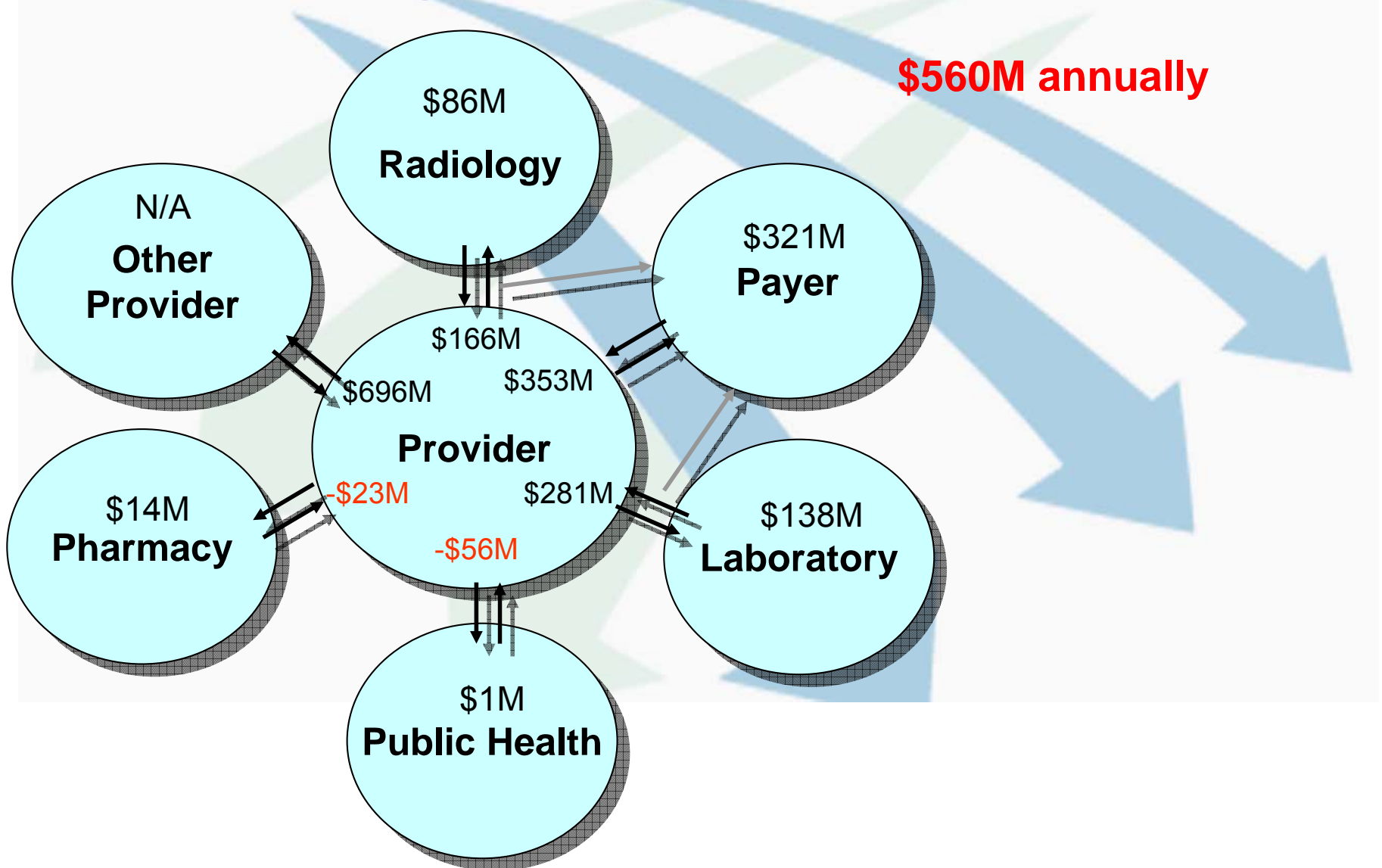
- Patients
- Researchers
- Investigators
- Pharma companies

- Patients
- Physicians
- Hospitals
- Payors
- Employers

- Patients
- Physicians
- Hospitals
- Public health
- Payors
- Employers

(1) Includes quality of care/other non-economic beneficiaries as well

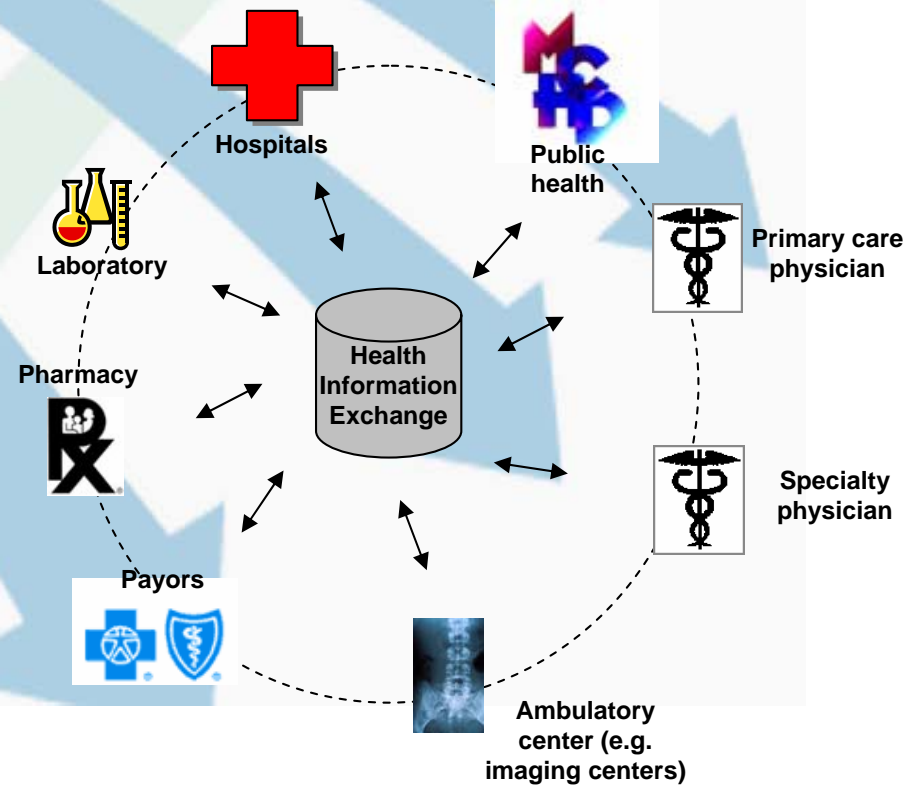
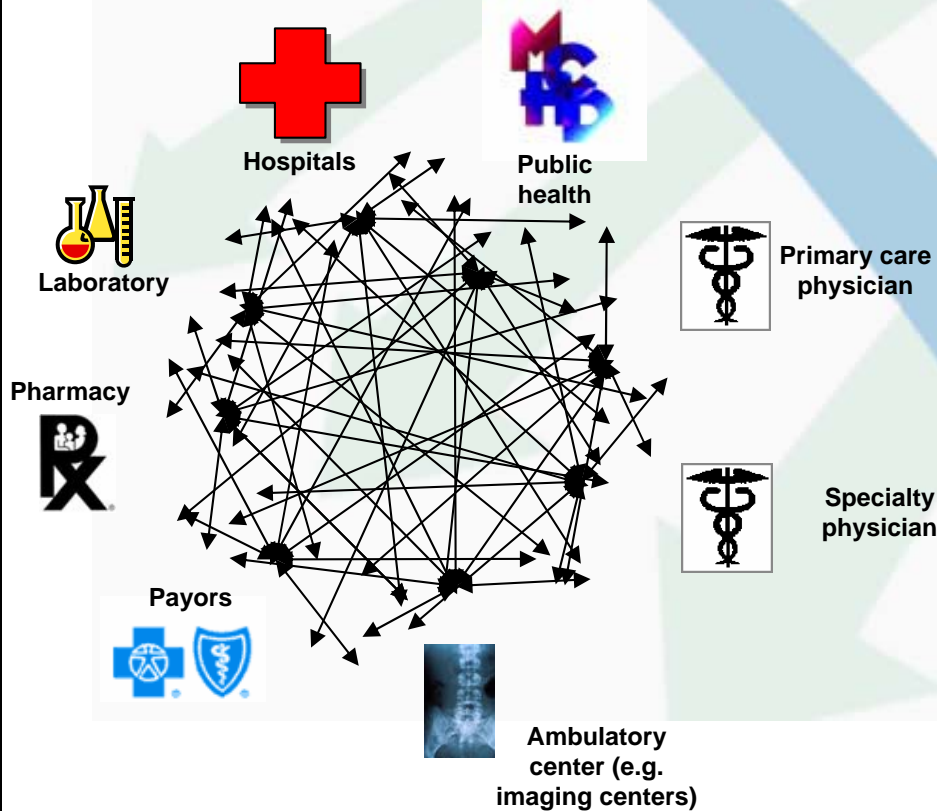
How much to the inefficiencies of health information exchange cost in the Indianapolis MSA



“Wiring” Healthcare

Current system fragments patient information and creates redundant, inefficient efforts

Future system will consolidate information and provide a foundation for unifying efforts





**Built on the
Indiana Network for Patient Care ...**

INPC Project Goal

Demonstrate the feasibility, benefit and sustainability of a community wide electronic medical record system in patient care.



INPC Data sources

- 24 hospitals including the 5 major hospital systems (99% of non-office care) and community hospitals
- National and regional laboratories
- Local imaging centers
- All four homeless care systems
- Public health departments (county and state)
- Approximately 1/3 of ambulatory physicians

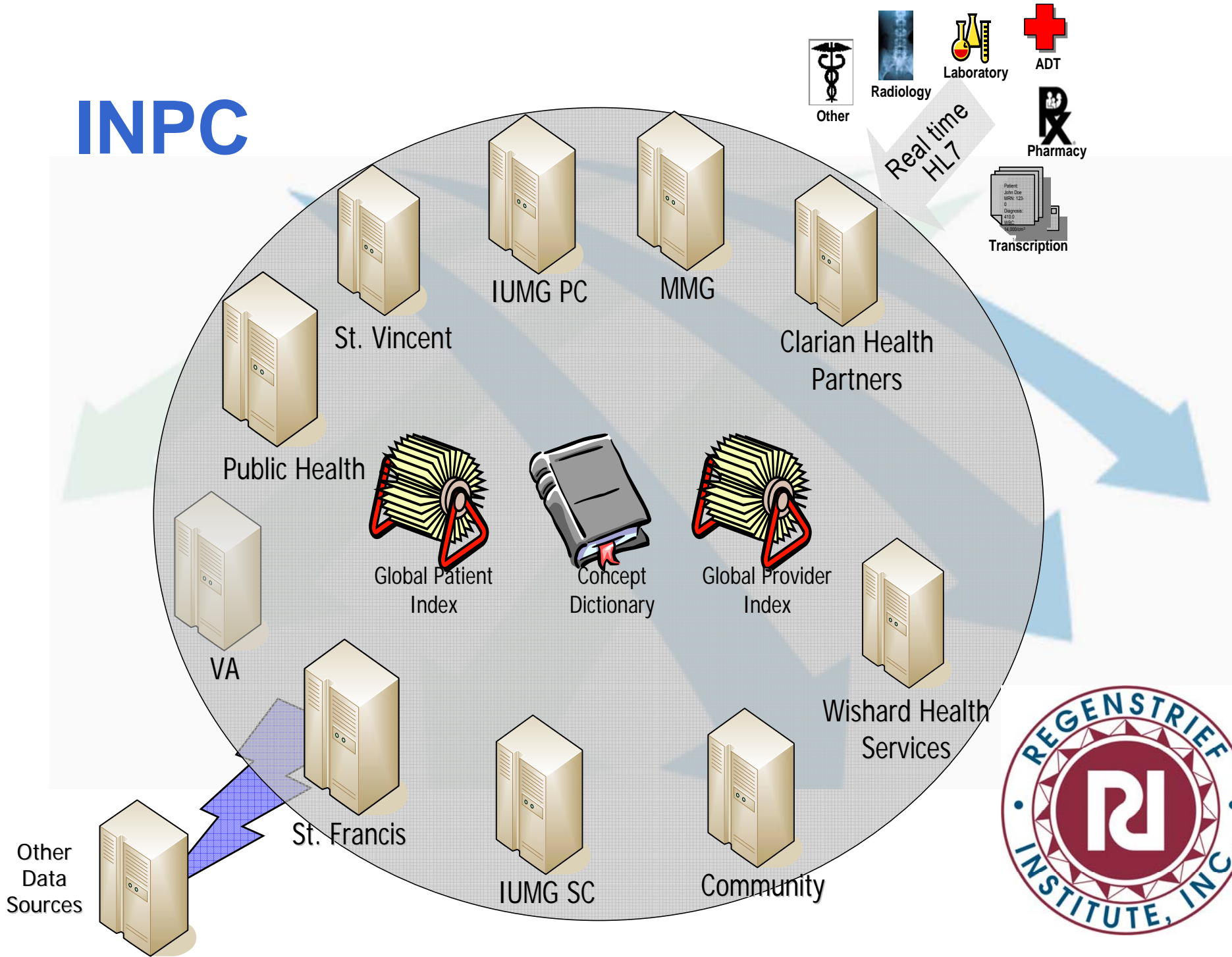


INPC Data

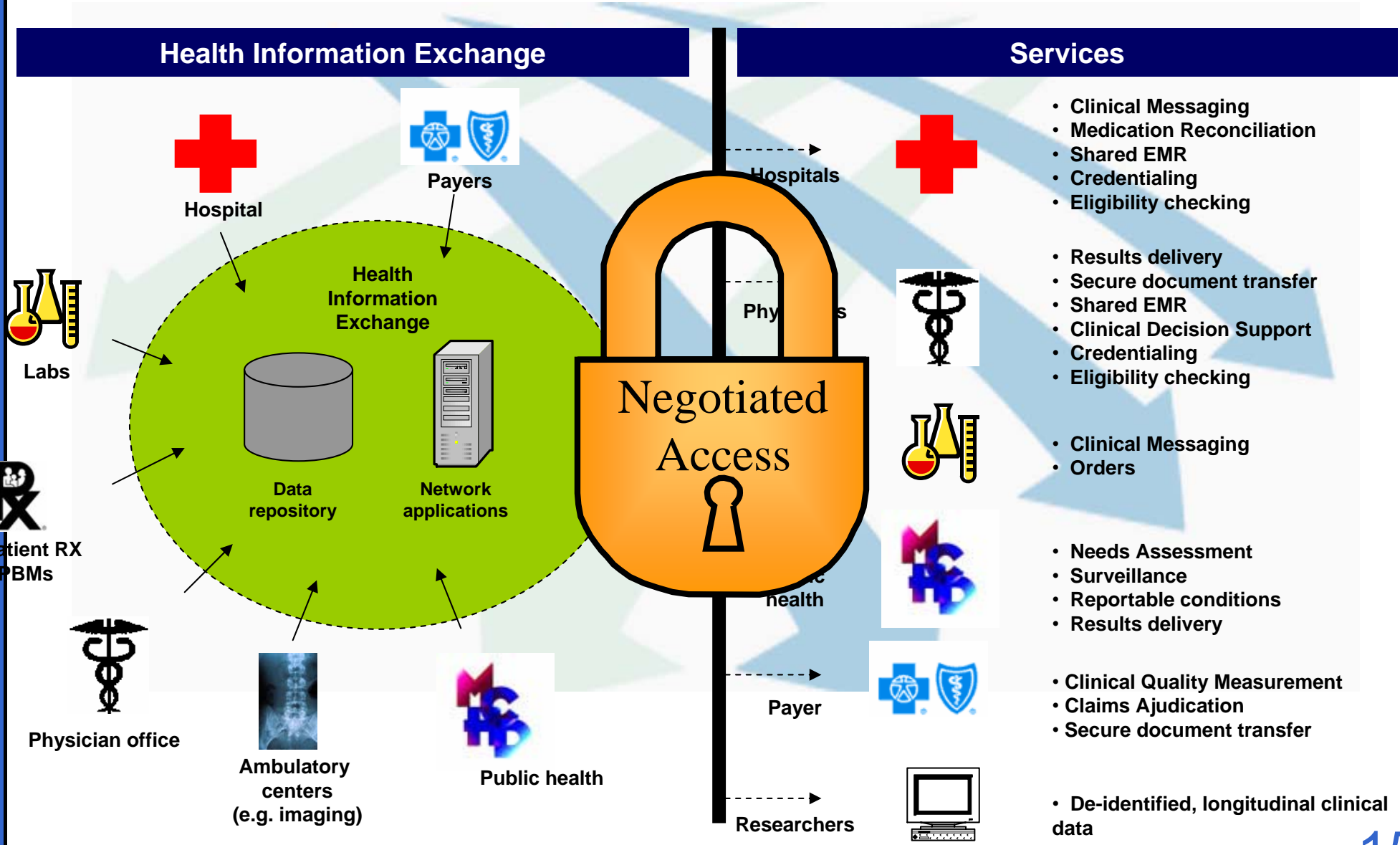
- 7 million registration “events”
- 60 million orders
- 900 million coded results
- 20 million dictated reports
- 8.8 million radiology reports
- Hundreds of millions prescriptions
- 750,000 EKG tracings
- 45 million radiology images



INPC



Health Information Exchange Services





Clinical Abstract & Results Review

DEMO,JOHNATHAN DOE

#99999999-8 Phone:925-1443 Age:54yr Race:B Sex:M

EMERGENCY CARE ABSTRACT

ER CHIEF COMPLAINT
VOMITING/DIARRHEA/BACK PAIN/HEADACHE 06-MAY-98

HISTORY & PHYSICAL

DX & COMPLAINTS 14-JAN-97
diabetes mellitus
TB active
anemia othr
foot ulcer(s)
urine retention
decubitus ulcer

E.R. DIAGNOSIS 24-APR-97
hyperglycemia
otitis media
crush injury

BLOOD TYPE

PRENATAL ABO RH 24-APR-97
INDIRECT AGT NEGATIVE
Rh positive
ABO GROUP AB
ANTIBODY SCREEN neg 05-FEB-91

VITALS

OUTPATIENT VITALS 24-APR-97
WEIGHT LBS 98 LBS
SYS BP SITTING 116 MM HG
DIAS BP SITTING 81 MM HG
PULSE 71 /MIN
TEMPERATURE 98.7 (a) DEG F
(a) From MEDICINE

INPATIENT VITALS 12-FEB-91
WEIGHT AUTO 91.6 LBS
TEMP AUTO ORAL 97.5*L DEG F 31-JAN-91
PULSE AUTO 80 /MIN 12-FEB-91

CHEMISTRY (continued)

CHEM 16 24-APR-97
SGPT (ALT) 28 UNITS
CK 109 UNITS 16-JAN-91
AMYLASE <30*L UNITS
GGT 40 IU/L 24-APR-97

HEMATOLOGY

BLOOD CELL PROFILE 24-APR-97
WBC 3.5*L THOU/CU MM
RBC 3.88*L MILL/CU MM
HGB 12.5*L (a) G/DL
HCT 37.3*L ‡
MCV 95.9*H fl
MCH 32.2*H PG
MCHC 33.6 G/DL
RDW 15.5*H ‡
(a) From IUMC Lab

DIFFERENTIAL 24-APR-97
PLT EST DECREASED

COMMON HEMATOLOGY STUDIES 24-APR-97
PLT CT 82.0*L THOU/CU MM
RETIC CT 5.7*H ‡ 06-FEB-91
VITAMIN B12 LVL 1013 PG/ML 16-OCT-89
FOLATE LVL 6.0 NG/ML 11-MAY-87
IRON-SATURATION 38*H ‡ 02-NOV-90

ROUTINE COAG 24-APR-97
PT CONTROL 12.0 SEC 30-JUL-87
PROTIME (ISI1) 17.8*H SEC 24-APR-97
INR 1.4*H
APTT PATIENT DUPLICATE(a) SEC

URINE STUDIES (continued)

COMMON URINE STUDIES 27-JAN-91
CREAT:URN 47 MG/DL 14-AUG-90
CREAT-TM:URN 0.56*L G/TV 16-DEC-89
CREAT CLR RATE NO SPECIM(a) ML/MIN 24-APR-97
CREAT SER 0.6 MG/DL 16-DEC-89
CREATININE:URN 19.0*L MG/DL
(a) NO SPECIMEN RECEIVED IN LAB

THYROID STUDIES

THY 05-JAN-90
T3 UPTAKE RATIO 0.78*L

PULMONARY

BLD GAS PANEL 1 24-APR-97
TEMPERATURE 98.7 (a) DEG F
HGB 12.5*L (b) G/DL
(a) From MEDICINE
(b) From IUMC Lab

CARDIOVASCULAR

CARDIAC ECHO 22-NOV-89
cardiomegaly mod
LV motion nml
EKG 30-MAR-98
normal sinus rhythm, normal ECG

RADIOLOGY/NUCLEAR MED

CHEST PA & LATERAL 11-FEB-91
HOSP
right
fluid NOS

years [WISHARD]

OVERHAGE, JOSEPH M

Browse Patient Record » Flowsheet

Select a patient | Browse Patient Record | Other

Hide Menu | Graph | Setup | Next | Prev | Praxis | Logout | Help

ACA TESTS	22-Dec-90 06:00	21-Dec-90 06:00	20-Dec-90 06:00	07-Jun-90 07:31	21-Sep-88 21:08	03-Feb-88 16:49	18-Sep-87 16:22	16-Nov-86 06:00	15-Nov-86 06:00	13-Nov-86 20:40	Units
<input type="checkbox"/> Sgot'								42*H {} ?	42*H {} ?	43*H {} ?	UNITS/L
<input type="checkbox"/> Lactate					0.2*L {} ?		0.4*L {} ?				mmol/L
<input type="checkbox"/> Ggtp	190*H {} ?		331*H {} ?	254*H {} ?							UNITS/L
<input type="checkbox"/> Lipase"						7 {} ?				8 {} ?	UNITS/L
<input type="checkbox"/> Aca panel 1		Cancelled by Ward {} ?									

{ } - From WISHARD, 0879309-3

BILIRUBINS-FX	19-Jul-99 04:20	28-Jun-95 06:08	03-Jun-95 14:29	09-Oct-90 08:01	11-Feb-90 09:38	07-Jun-88 22:03	18-Sep-87 13:02	15-Jul-87 06:00	04-Dec-86 06:00	16-Nov-86 06:00	15-Nov-86 06:00	13-Nov-86 20:40	Units
<input type="checkbox"/> Bili-tot	1.5*H {} {m} ?	1.8*H {} {n} ?	1.2 {} {n} ?	1.9*H {} {o} ?	1.2 {} {o} ?	2.6*H {} {o} ?	3.4*H {} {o} ?	3.2*H {} {o} ?	1.9*H {} {o} ?	1.6*H {} {o} ?	1.6*H {} {o} ?	2.0*H {} {o} ?	m
<input type="checkbox"/> Bili dir'		0.5*H {} {n} ?	0.3 {} {n} ?	1.1*H {} {o} ?	0.7*H {} {o} ?	1.3*H {} {o} ?	1.4*H {} {o} ?	1.2*H {} {o} ?	0.7*H {} {o} ?	0.4 {} {o} ?	0.6*H {} {o} ?	0.5*H {} {o} ?	m
<input type="checkbox"/> Bili indir				0.8 {} {o} ?	0.5 {} {o} ?	1.3*H {} {o} ?	2.0*H {} {o} ?	2.0*H {} {o} ?	1.2*H {} {o} ?	1.2*H {} {o} ?	1.0*H {} {o} ?	1.5*H {} {o} ?	m

{m} - From Methodist Lab (SQLAB), 7130/REGEN/0/1DE5/load/top.subdoc
 {n} - From Methodist Archive Lab, 7130/REGEN/0/1DE5/load/top.subdoc
 {o} - From WISHARD, 0879309-3

SMA12'	16-Aug-87 06:00	15-Aug-87 18:58	14-Jul-87 17:13	24-Mar-87 06:00	10-Mar-87 16:02	18-Dec-86 06:29	30-Nov-86 14:43	27-Oct-86 06:00	Units
<input type="checkbox"/> Albumin (sma)	3.2*L {} {p} ?	3.6*L {} {p} ?	3.4*L {} {p} ?	3.1*L {} {p} ?	4.2 {} {p} ?	3.4*L {} {p} ?	3.8 {} {p} ?	3.9 {} {p} ?	g/dL
<input type="checkbox"/> Alk phos (sma)	169*H {} {p} ?	205*H {} {p} ?	212*H {} {p} ?	324*H {} {p} ?	143*H {} {p} ?	145*H {} {p} ?	123 {} {p} ?	122 {} {p} ?	UNITS/L
<input type="checkbox"/> Bun (sma)	3*L {} {p} ?	2*L {} {p} ?	5*L {} {p} ?	3*L {} {p} ?	6*L {} {p} ?	2*L {} {p} ?	2*L {} {p} ?	6*L {} {p} ?	mg/dL
<input type="checkbox"/> Calcium (sma)	8.3*L {} {p} ?	8.7 {} {p} ?	8.4 {} {p} ?	8.7 {} {p} ?	9.1 {} {p} ?	8.7 {} {p} ?	9.2 {} {p} ?	8.9 {} {p} ?	mg/dL
<input type="checkbox"/> Chol (sma)	85*L {} {p} ?	88*L {} {p} ?	107*L {} {p} ?	100*L {} {p} ?	109*L {} {p} ?	104*L {} {p} ?	104*L {} {p} ?	94*L {} {p} ?	mg/dL
<input type="checkbox"/> Creat (sma)	0.5 {} {p} ?	0.4 {} {p} ?	0.6 {} {p} ?	0.5 {} {p} ?	0.4 {} {p} ?	0.4 {} {p} ?	0.3*L {} {p} ?	0.5 {} {p} ?	mg/dL

Medication Reconciliation

(Supplied by Regenstrief & INPC)

Patient Medication History:

Date: 12/07/2004

Patient Id: 2222
 Name: SCHNUR, BERT L
 Address: 63050
 DOB: 04/19/1945

Gender: Male

Medication History Date Range:
 12/08/2003 - 12/07/2004

DISCLAIMER: Certain information may not be available or accurate in this report, including over-the-counter medications, low cost prescriptions, prescriptions paid for by the patient or non-participating sources, or errors in insurance claims information. The provider should independently verify medication history with the patient.

Summary:

Drug Name	Oldest Fill Date	Most Recent Fill Date	#of Fills
DIGITEK 250 MCG TABLET	08/01/2003	08/01/2003	1
DIGITEK 125 MCG TABLET	02/01/2003	07/01/2003	3
LANOXIN 50 MCG/ML ELIXIR	04/01/2003	05/01/2003	2

Pharmacies:

Key Reported Pharmacies	Pharmacy Phone
1 ADVANCERX.COM	877-831-1324
2 WAL-MART #2514	651-456-6325

Key Reported Prescribers

A JEFFRIES, RHONDA

Detail Information:

DIGITEK 250 MCG TABLET (DIGOXIN)

Fill Date	Qty	Days	Prescriber	Pharmacy	Source
08/01/2003	30	30	A	2	RXHUBPBM

DIGITEK 125 MCG TABLET (DIGOXIN)

Fill Date	Qty	Days	Prescriber	Pharmacy	Source
07/01/2003	30	30	A	2	RXHUBPBM
06/01/2003	30	30	A	2	RXHUBPBM
02/01/2003	30	30			RXHUBPBM

LANOXIN 50 MCG/ML ELIXIR (DIGOXIN)

DOCS4DOCS Clinical Messaging

Physician Office

“Hey Sally!
Where is Mrs.
Jones x-ray?”

Printer with
results from
one lab

Unsorted
results

About to
ring with
stat results

Prescription refill
request on fax
machine (Right
behind the joke of the
day)

Unopened
mail

Courier just
dropped off
more
envelopes

Web portal!
(from one
hospital)



User Authentication

- User authenticates to portal
- User clicks IHE link
- Portal encodes special digitally signed URL with user name & timestamp and browser and redirected to DOCS4DOCS[®]
- DOCS4DOCS[®] maps portal name to internal account

The screenshot shows the Clarian.org administrator interface. At the top left is the 'pulse' logo with the tagline 'connecting the Clarian community'. A banner at the top center promotes the Dell Employee Purchase Program. The top right shows the date 'Tuesday Aug. 23, 2005' and a 'Welcome Ronak' message with a 'Logoff' button. Below the header is a navigation bar with tabs for 'Clarian.org', 'Physicians', 'Nurses', and 'Employees'. A secondary navigation bar includes 'My Portal', 'Employee Services', 'Communities', 'Project Communities', 'Forms', 'S-OLAR', and 'Customize'. The main content area is titled 'Administer' and contains several widgets: 'Order Sets Search' with radio buttons for 'Methodist', 'Clarian West', and 'Riley'; 'Login To IHIE' with a link to 'Docs4Docs'; 'Physician Order Sets' with a list of categories; 'Physician Reference Tools' with a list of links; 'Physician Contacts'; 'Weather Forecast' for Indianapolis, IN; 'Physician Systems Access' with links to 'Careweb', 'GE Pacs', 'IDX', and 'Softmed'; and 'Physicians Document Exchange'.

Once authenticated, the user access's clinical messaging through a link on a provider's portal or IHIE's community portal

The screenshot shows the 'IHIE Portal' login page. It features a header 'IHIE Portal' and a welcome message: 'Welcome to the Indiana Health Information Exchange portal. Please enter your username and password, then press "Log in".' Below this is a login form with fields for 'Username' (containing 'overhage') and 'Password' (containing '*****'). There are two radio button options for 'Destination': 'Go directly to DOCS4DOCS®' (which is selected) and 'Edit my IHIE portal profile'. A 'Log in' button and a 'Forgot your password?' link are also present.

DOCS4DOCS®

#2 Gross, Betsy
Dr. Cushing

DOCUMENT INBOX

General
Inbox
Inbox History
Report Search
System Messages
Help
Logout

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2001-2005. All Rights Reserved.

Document INBOX

Holds all new documents.

Filters:

Actions:

	Provider	MRN	Patient Name	Arrival	!	Doc Type	Doc Details
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/27 01:00 PM	!	Lab	STAT AMYLASE SERUM [Forwarded]
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/26 03:20 PM		Transcription (Clarian)	New Patient Evaluation
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/26 05:50 PM		Lab (Clarian Indiana University)	ALT SerPI QN
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/26 05:50 PM		Lab (Clarian Indiana University)	AST SerPI QN
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 10:50 AM		Lab (Clarian Indiana University)	Creatinine SerPI QN
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 10:50 AM	!	Lab (Clarian Indiana University)	Lipid Panel SerPI QN
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 04:50 PM	!	Lab (Clarian Indiana University)	CD4 Followup
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/20 06:20 AM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 02:10 PM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/26 10:40 AM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/25 11:21 AM	!	Lab (Clarian MW)	CBC
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/25 11:21 AM	!	Lab (Clarian MW)	Auto Diff
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/25 12:20 PM		Lab (Clarian MW)	Creatinine SerPI QN
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/25 02:30 PM	!	Lab (Clarian MW)	Vancomycin Pre SerPI QN
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 02:10 PM		Transcription (Clarian)	New Patient Evaluation
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/20 01:30 PM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 04:00 PM		Transcription (Clarian)	Discharge Summary
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/20 09:50 AM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/25 09:20 AM		Radiology (Clarian)	CT Lower Extremity With Contrast
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/26 10:30 AM		Transcription (Clarian)	New Patient Evaluation
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 02:10 PM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/26 02:20 PM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/19 02:10 PM		Transcription (Clarian)	Return Clinic Visit
<input type="checkbox"/>	Cushing, Herbert E.			2006 01/20 10:10 AM		Transcription (Clarian)	Return Clinic Visit

#2 Gross, Betsy
 Dr. Cushing

INBOX Review

Navigation:
 Actions:

Copy for: Cushing, Herbert E. Pt:



Riley Hospital
 550 N University Blvd
 Indianapolis, IN 46202

Pt: Acct: MR#: DOB: Sex: M
 Home: Work: (000)000-0000

Date: 01/19/2006 09:48:00 Accession: Location: UMDC
 Ordered by: Cushing, Herbert E

Procedure	Value	Flag	Units	Ref Range
Specimen Type	Blood			
CD3- Pan T Cell	79	H	%	64-78
CD4-Helper T	39		%	37-58
CD8-Suppress T	42	H	%	14-32
CD4:CD8 Ratio	.90			.90-4.50
Abs Lymphocyte-Flow	3280		/mm3	1400-3800
Absolute CD3	2591	H	/mm3	1000-2300
Absolute CD4	1273		/mm3	550-1600
Absolute CD8	1391	H	/mm3	200-700

*** CD4 Followup ***
 This test was developed and its performance characteristics determined by Clarian Health Partners, Department of Pathology and Laboratory Medicine. It has not been cleared or approved by the U.S. Food and Drug Administration (FDA). The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

Test performed at Riley Hospital 550 N University Blvd Indianapolis, IN 46202

Clinical Messaging Status

- Data sources online:
 - St. Vincent lab, rad, ADT, EKG, transcription
 - Community lab, rad, ADT, EKG, transcription
 - St. Francis lab, rad, ADT, EKG, transcription
 - Clarian Health lab, rad, ADT, EKG, transcription
 - ISDH laboratory
 - Wishard Health services lab and ADT ready for pilot
- Physicians connected: 2,950 (out of 3,300)
- Messages delivered per day: ~29,000
- Expected costs savings annually : ≈\$6M
- Data sources upcoming:
 - Mid America Clinical Labs (early 2006)
 - Morgan County Hospital (early 2006)
 - Northwest Radiology (Q3 2006)
- New data sources in development: ≈20



Data Source Benefits

- **Faster, cheaper more reliable results delivery**
- Less effort to maintain physician contact information
- Provides economies of scale
- Frees your personnel to provide billable services rather than answering the phone and helping find misplaced or worse yet, undelivered, results
- Reduces the need to create outbound interfaces as providers adopt EMRs
- Increased provider satisfaction from a single source for their clinical results

Future Value to Community

- Laying a foundation which will enable:
 - Flow of structured data
 - Engaging physicians in transforming their practice
 - New services to improve quality, safety and efficiency
 - Clinical Quality Data Services
 - EMR “light”
 - Others...

Current Service Summary

- IHIE DOCS4DOCS Clinical Messaging
 - “Push” results to the ordering and copy to doctors
 - Fee per message delivered
- INPC Clinical Abstract
 - “Push” summary of patient’s clinical data to doctor
 - No charge to INPC participants
- INPC Results Review
 - Doctor “Pulls” comprehensive patient clinical data
 - No charge to INPC participants
- Regenstrief Medication Reconciliation
 - “Push” medication history to hospital
 - Fee per medication history delivered

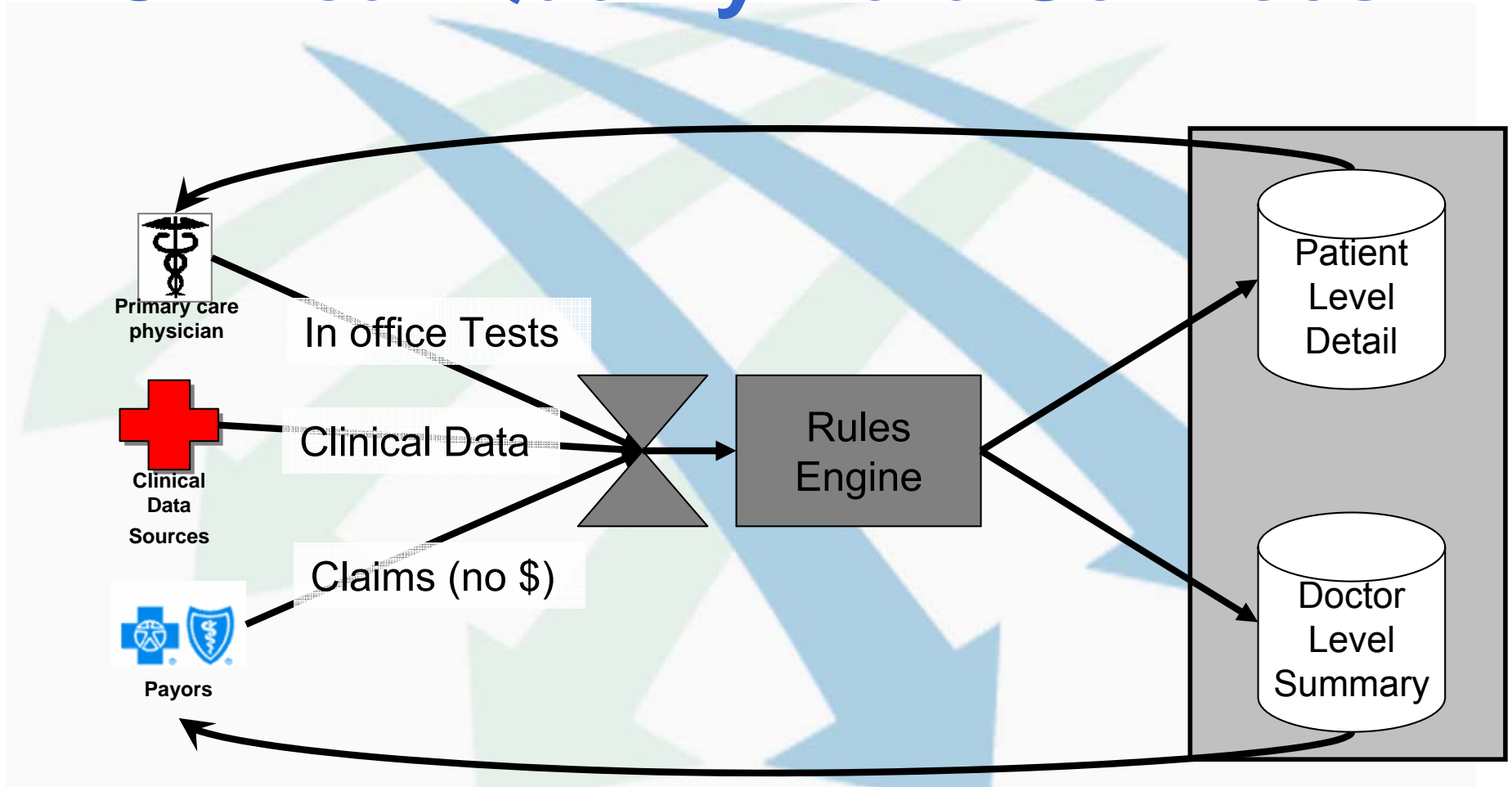
Clinical Quality Data Services

(Supplied by IHIE)

Clinical Quality Data Services

- Pay-for-Value with common measures across payors including efficiency and participation
- Commercial, Medicaid and Medicare Payors (we hope!)
 - Anthem (Wellpoint) playing leadership role
 - 600,000 lives
- Combines clinical and claims data
- Initially focused on primary care
 - Cardiovascular and Oncology to follow

Clinical Quality Data Services



Benefits

- Physicians
 - Full detail on their own patients
 - Summary comparisons
 - Overall
 - Population (commercial, Medicare, Medicaid)
- Health Plans and PHOs
 - Full detail on their own members
 - Summary information across all patients by:
 - Participating physician
 - Specialty
 - Population (commercial, Medicare, Medicaid)

Service Summary

- IHIE DOCS4DOCS Clinical Messaging
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- Regenstrief Medication Reconciliation
 - “Push” medication history to hospital
 - Fee per medication history delivered
- IHIE Clinical Quality Data Services
 - “Push” reminders to providers
 - Payors (health plans and employers) support costs