



Bob Elson, MD, MS  
Clinical Systems Design, LLC  
bob.elson@gmail.com

## Rx Claims for Reconciliation

### Current Status and Research Opportunities

MetroHealth HSR Seminar  
November 4<sup>th</sup>, 2005



## Prescription History via Claims Data

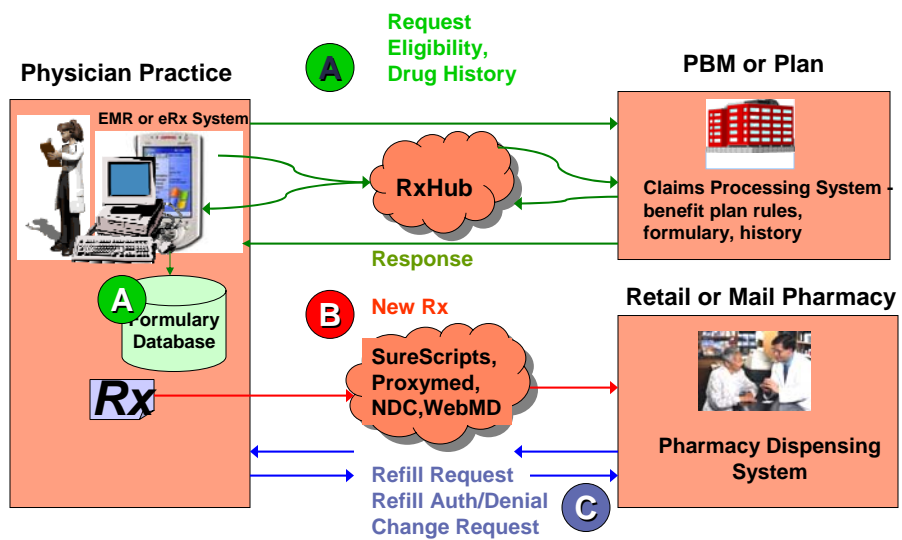
- Overview of e-prescribing
- Reconciliation in the spotlight
- How it works
- National and regional experience
- Knowledge gaps / research opportunities

## Definition of e-Prescribing:

- “the use of computing devices to enter, modify, review, and output or communicate drug prescriptions”
  - eHealth Initiative e-prescribing report, April '04
- “computerized systems that clinicians use to prescribe medications”
  - RAND Expert Advisory Panel on e-prescribing
- Schiff & Rucker, JAMA '98
  - Called for elimination of prescriptions “written by hand”
  - No call for elimination of routing by land
- For better or worse...
  - Increasing association of “e-prescribing” with routing aspects
  - MMA e-prescribing rules only applicable if data transmission (?)

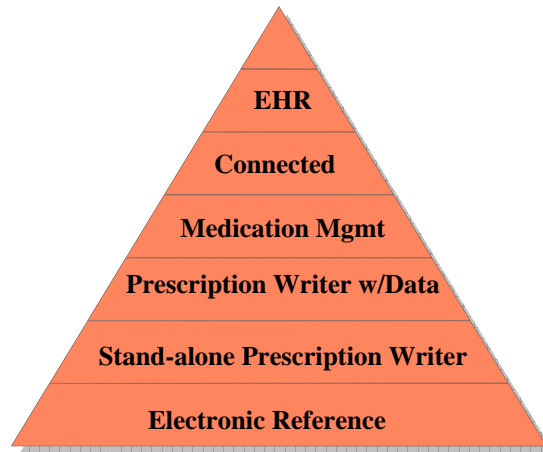
2

## Connected e-Prescribing: Pre- vs. Post-Prescription



3

## The eHI Pyramid (Problematic)



Source: eHealth Initiative

4

## CITL ACPOE Report

- \$29B in savings from ubiquitous e-prescribing
  - \$27B from reduced drug spend; \$2B from ADE prevention

### Basic Systems

- Basic record and print functionality
- Passive, lookup-only formulary management
- Passive, lookup-only clinical decision support

### Intermediate Systems

- Record, print, fax and/or e-mail functionality
- Active on/off formulary management
- Active clinical decision support, including drug/drug and drug/allergy warnings, as well as default or suggested dosing

### Advanced Systems

- Active formulary management which includes both on/off and tiered formulary support
- Active clinical decision support for drug/drug and drug/allergy warnings, default or suggested dosing and suggested medications and dosing based on best practice guidelines and patient-specific lab and study results

Source: CITL, 2003

5

## Certification (Still in Infancy)

- Needed for P4P, reimbursement, ensure interoperability
- CCHIT
- HL-7
- RAND consensus criteria
- CDS in e-prescribing task force

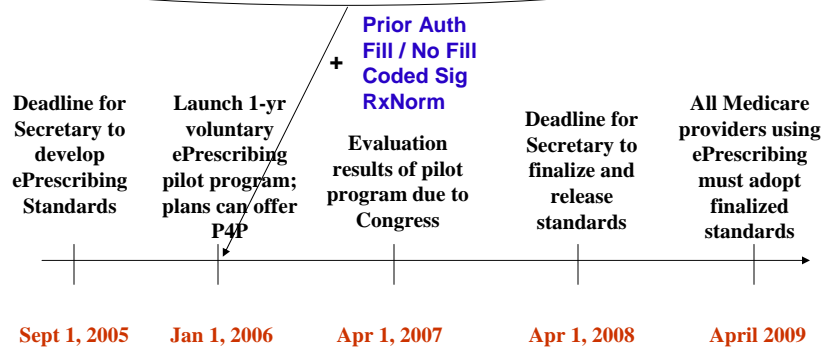


6

## MMA (Part D): e-Prescribing Rules

- Feb '05: Proposed Foundation Standards
  - NCPDP SCRIPT New Rx, Refill Request/Response
  - X12N 270/271 Eligibility Request/Response
  - Drug History (RxHub SCRIPT-like format in process for NCPDP approval)
  - Formulary and Benefits (in process for NCPDP approval)

11/05 Actual Rules



7

## Prescription History Transaction Standard

### NCVHS Recommendation:

“HHS should actively participate in and support rapid development of an NCPDP standard for a medication history message for communication from a payer/PBM to a prescriber, using the RxHub protocol as a basis.”

8

## Prescription History via Claims Data

- Overview of e-prescribing
- Reconciliation in the spotlight
- How it works
- National and regional experience
- Knowledge gaps / research opportunities

9

## Katrina Relief

### Health records of Katrina evacuees go online

Government to allow doctors in shelters access to patients' medical data

By Jonathan Krim  
[The Washington Post](#)  
Updated: 2:11 p.m. ET Sept. 14, 2005

The federal government is making medical information on Hurricane Katrina evacuees private records from various pharmacies and other health care providers have been c

The data contain records from 150 Zip codes in areas hit by Katrina. Starting yesterd evacuees could go to the Internet to search prescription drug records on more than 6 region.

Officials hope to soon add computerized records from Medicaid in Mississippi and Louis health facilities, laboratories and benefits managers.

The records are one step in reconstructing medical files on more than 1 million people and drug stores. Officials fear that many medical records in the region, especially tho

"We think this could help save some lives," said Dr. David J. Brailer, Department of Health and Human Services, who is spearheading the

The system took about 10 days to organize, with daily conference c emergency medical providers; insurance, pharmacy and medical-sof

<http://www.katrinahealth.org><sup>10</sup>

## Commission on Systemic Interoperability

Commission on Systemic Interoperability

### Ending the Document Game

Connecting and Transforming  
Your Healthcare Through  
Information Technology

**"fully interoperable drug record for every American by 2010"**

## JCAHO 2005 Reconciliation NPSG

**Goal: Accurately and completely reconcile medications across the continuum of care**

- **“During 2005, for full implementation by January 2006, develop a process for obtaining and documenting a complete list of the patient's current medications upon the patient's admission...”**

[http://www.jcaho.org/accredited+organizations/hospitals/npsg/05\\_npsg\\_hap.htm](http://www.jcaho.org/accredited+organizations/hospitals/npsg/05_npsg_hap.htm)

12

## Prescription History via Claims Data

- Overview of e-prescribing
- Reconciliation in the spotlight
- How it works
- National and regional experience
- Knowledge gaps / research opportunities

13

## RxHub Overview

- Founded 2001 as electronic information exchange
- Three largest pharmacy benefits managers (PBMs)
  - Medco, Express Scripts, AdvancePCS (Caremark)
  - 140+ million covered lives (80% of commercial market)
- Mission
  - Deliver outpatient Rx benefit information to point-of-care

14

## Regional Coverage by RxHub MPI (12/04)

■ Monmouth-Ocean, NJ	89.4% (1.02 / 1.14M)
Nassau-Suffolk, NY	84.8% (2.34 / 2.76M)
Bergen-Passaic, NJ	81.9% (1.13 / 1.38M)
Newark, NJ	75.8% (1.56 / 2.05M)
Philadelphia	74.5% (2.87 / 3.85M)
Baltimore/DC	73.9% (3.40 / 4.61M)
New York, NY	69.8% (6.50 / 9.31M)
New Haven-Bridgeport, CT	66.7% (1.11 / 1.66M)
Detroit, MI	64.8% (2.89 / 4.46M)
<b>Columbus, OH</b>	<b>63.4% (0.97 / 1.54M)</b>
Boston, MA	60.7% (3.14 / 5.18M)
Pittsburgh, PA	59.5% (1.40 / 2.36M)
St. Louis, MO	57.6%
Austin, TX	54.5%
<b>Cleveland, OH</b>	<b>53.9% (1.21 / 2.24M)</b>
West Palm Beach, FL	53.5%
Milwaukee, WI	52.7%

15

## Connected to RxHub

### eRx / EMR Vendors

- A4
- Allscripts\*
- Athena
- Bond Medical
- Cardtronic
- Cerner
- DrFirst.co
- HealthCamp\*
- Hvision\*
- InstantDX\*
- iScribe\*
- McKesson
- MDanywhere
- MedPlus\*
- MedPort
- MedGen\*
- Metel
- ReCare
- Relay Health
- RxNT\*
- RxRite
- SafeMed
- ScriptRx
- Wellinx
- ZixCorp\*

### PBM / Health Plans

- Caremark/APCS\*
- Express Scripts\*
- Medco Health Solutions\*
- SXC
- CAQH\*

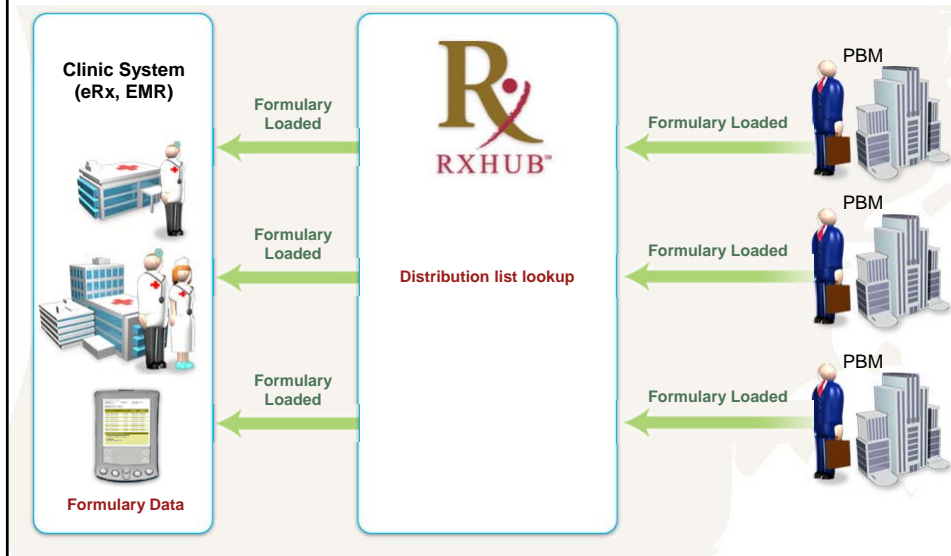
### Hospitals / HIEs / Distributors

- Barnes\*
- Regenstrief / IHIE\*
- Medsinfo-ED\*
- Siemens

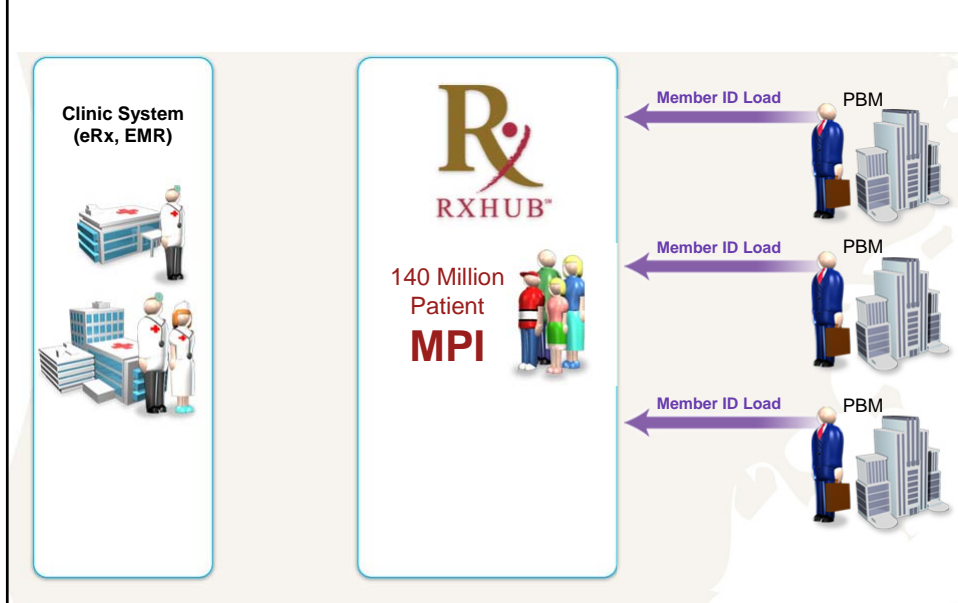
\* In production

16

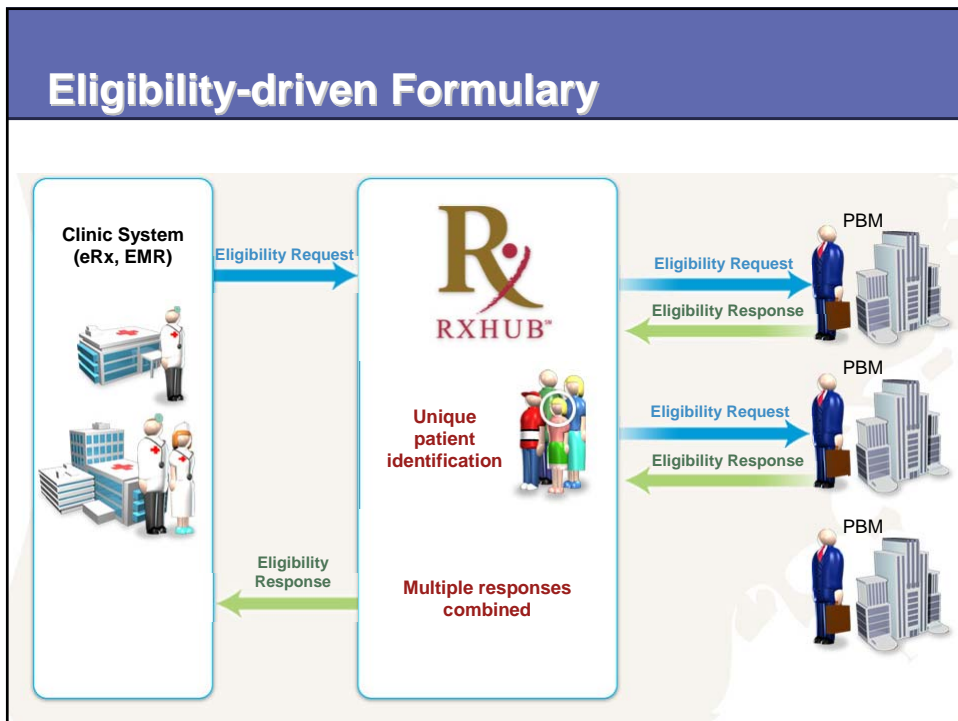
## Formulary Data Transfer



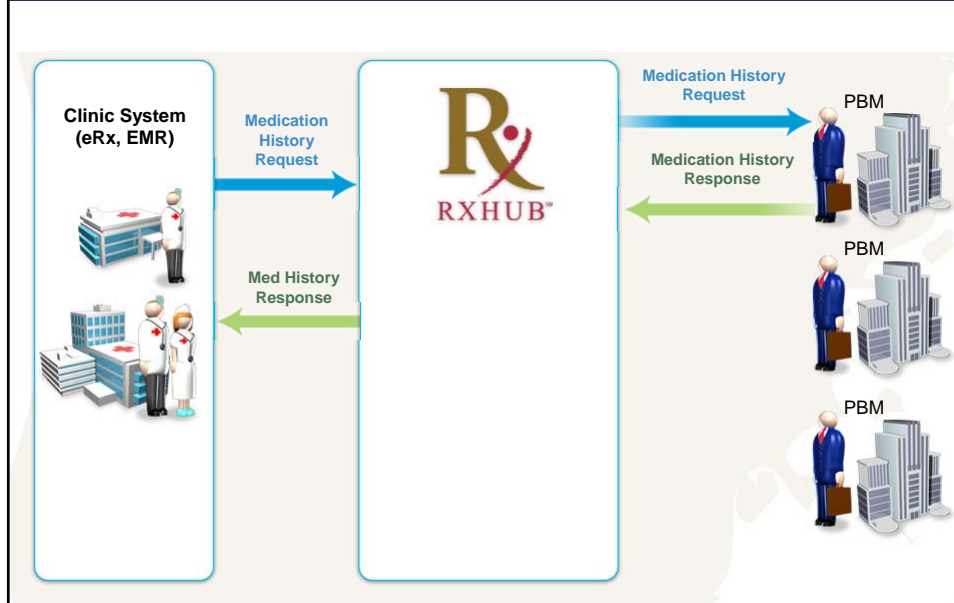
## RxHub Master Person Index (MPI)



## Eligibility-driven Formulary



## Rx Claims History (via eRx application)



## Two Examples

### eRx / EMR Vendors

- A4
- Allscripts\*
- Athena
- Bond Medical
- Cardtronic
- Cerner
- **DrFirst.com\***
- HealthRamp\*
- HEALTHvision\*
- **InstantDX\***
- iScribe\*
- McKesson
- MDanywhere
- MedPlus\*
- MedPort
- NextGen\*
- Phytel
- ReCare
- Relay Health
- RxNT\*
- RxRite
- SafeMed
- ScriptRx
- Wellinx
- ZixCorp\*

### PBMs / Health Plans

- Caremark/APCS\*
- Express Scripts\*
- Medco Health Solutions\*
- SXC
- CAQH\*

### Hospitals / HIEs / Distributors

- Barnes\*
- Regenstrief / IHIE\*
- Medsinfo-ED\*
- Siemens

\* In production

21

# Rx Claims via eRx app: Example 1

Welcome Krishnan Seshadri

OnCallData  
Scripts | Electronic Refill NEW! | Admin  
Write a Script | Pending Scripts | Script History | Scripts

**Write a Script**

**Patient** ✓  
Testing, Joel - 04/16/1983  
Nowhere, HI 20910  
Prescription Plan: Medco  
[PBM Drug History](#)  
[Edit Insurance](#)  
[Check Eligibility](#)  
**Eligibility last checked on 9/28/2005.**  
Warning: No allergies have been recorded for this patient. To add, click [here](#).  
[Change Patient](#)

**Therapy / Regimen**  
Prescriber: Mr. Krishnan Seshadri, [v]  
[New](#) Choose from Favorites  
[New](#) Choose from Favorites  
[New](#) Choose from Favorites  
[New](#) Choose from Favorites  
[New](#) Choose from Favorites

Copyright © 2000 InstantDx, LLC - All Rights Reserved.  
OnCallData (800) 576-0526 or (301) 208-9800 [Privacy Statement](#)

**Drug History for Joel Testing - DOB 4/16/1983**  
Last Insurance Drug History fetched: 9/28/2005 4:06 AM

Drug Info	Prescriber Info	Pharmacy Info
ZYRTEC 10MG #90, 090 days supply, Last Fill Date: 9/26/2005	Not Available	Not Available
ZYRTEC 10MG #90, 090 days supply, Last Fill Date: 9/23/2005	Not Available	Not Available
CONCERTA 54MG #180, 090 days supply, Last Fill Date: 8/26/2005	Not Available	Not Available
METHYLPHENIDATE HCL 10MG #180, 090 days supply, Last Fill Date: 8/26/2005	Not Available	Not Available
WELLBUTRIN XL 300MG #90, 090 days supply, Last Fill Date: 8/26/2005	Not Available	Not Available
WELLBUTRIN XL 300MG #90, 090 days supply, Last Fill Date: 5/19/2005	Not Available	Not Available
ZYRTEC 10MG #90, 090 days supply, Last Fill Date: 3/30/2005	Not Available	Not Available
CONCERTA 54MG #180, 090 days supply, Last Fill Date: 3/28/2005	Not Available	Not Available
CONCERTA 54MG #90, 090 days supply, Last Fill Date: 3/23/2005	Not Available	Not Available
METHYLPHENIDATE HCL 10MG #180, 090 days supply, Last Fill Date: 3/23/2005	Not Available	Not Available
WELLBUTRIN XL 150MG #90, 090 days supply, Last Fill Date: 1/31/2005	Not Available	Not Available
PROVENTIL HFA 90MCG		

DrFirst Recopia

Practice: Kaufman's test account User: Demo Kaufman [[Schedule](#)] [[Messages](#)]  
Patient: Yui Faker [[Prescribe](#)] [[Demographics](#)] [[Pharmacy](#)]  
Patient DOB: 02/14/1945 LOF: 04/04/2005 [[Visit Today](#)] Phone: (412) 555-3355 (home)  
Pharmacy: [Eckerd Drugs #6047](#) (1222 BROWNSVILLE ROAD) III Formulary: BCBS OF MASSACHUSETTS (ESI) [[Add](#)]

**PBM Drug History for Yui Faker**

This screen permits you to view those medications which the patient has filled using his or her pharmacy benefit program. It does not list medications that the patient has obtained by other means.

for last

Date history was last obtained: 01/14/2005  
 drugs to medication list.  
 to Patient Summary.

Date	Drug	Sig	Provider	Pharmacy
<input checked="" type="checkbox"/> 01/01/2005	cyclobenzaprine hcl [ <a href="#">Prescribe</a> ] Tablet 10 mg No Quantity Info	No Sig Info Substitution Permitted	DANNY DUBBERLY ROUTE 3, BOX 565 CROCKETT TX	WALGREENS #09023

**Medications:** ([Detail](#)) ([Min](#)) ([PBM History](#)) [[Refill Selected](#)]

- aspirin (Tablet, Delayed Release (E.C.) 81 mg) 1 tablet once a day Disp. 100 R# #3 (last: 04/05/2005) [[Refill](#)] [[Prescribe](#)] [[Stop](#)]
- atenolol (Tablet 50 mg) 1 tablet every morning Disp. 90 R# #3 (last: 04/05/2005) [[Refill](#)] [[Prescribe](#)] [[Stop](#)]
- Zocor (simvastatin) (Tablet 10 mg) 1 tablet once a day Disp. 90 R# #3 (last: 04/05/2005) [[Refill](#)] [[Prescribe](#)] [[Stop](#)]

**Allergies:** No known drug allergies (NKDA).

## Remember the JCAHO NPSG?

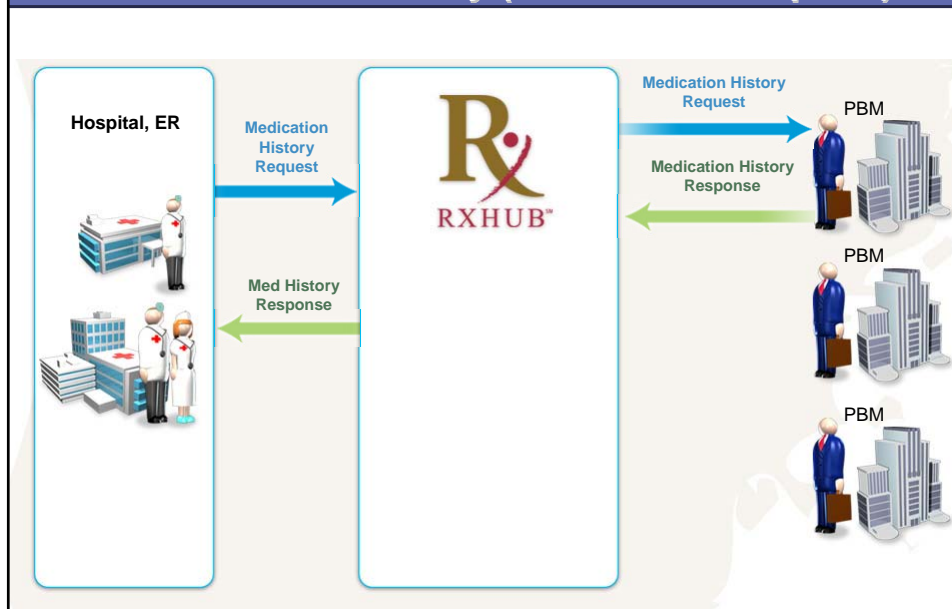
**Goal: Accurately and completely reconcile medications across the continuum of care**

- **“During 2005, for full implementation by January 2006, develop a process for obtaining and documenting a complete list of the patient's current medications upon the patient's admission...”**

[http://www.jcaho.org/accredited+organizations/hospitals/npsg/05\\_npsg\\_hap.htm](http://www.jcaho.org/accredited+organizations/hospitals/npsg/05_npsg_hap.htm)

24

## Claims-based Rx History (Standalone “Report”)



## Sample Claims History Text Report

### RxHub Patient Filled Prescription Report:

Patient ID: PATID1234  
Name: JONES, WILLIAM A.  
Address: 1200 N ELM STREET  
GREENSBORO, NC 27401-1020  
DOB: 06/15/1961 Gender: Male

Filled Prescription Date Range: 08/01/2002 - 08/01/2003

CAUTION: Certain information may not be available or accurate in this medication claims history, including over-the-counter 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.

#### ----- FILLED PRESCRIPTION SUMMARY -----

##### Summary:

Drug Name:	Strength Dosage	Oldest Fill Date	Most Recent Fill Date	#of Fills
HYDROCHLOROTHIAZIDE	50 MG	07/01/2002	08/01/2003	2
INSULIN	100 U/ML	08/01/2002	08/01/2003	13
GLUCOVANCE	2.5/500	12/15/2002	07/25/2003	8
GLUCOTROL XL	10 MG	8/01/2002	07/20/2003	12
PREVACID	30 MG	10/23/2002	06/30/2003	7
	15 MG	09/23/2002	09/23/2002	1
SLOW K	10 MG	10/29/2002	06/29/2003	6

#### ----- FILLED PRESCRIPTION DETAIL -----

##### HYDROCHLOROTHIAZIDE

Drug:	HYDROCHLOROTHIAZIDE 50 mg	Filed:	08/01/2003
Form:	50 mg TABLET		
Quant:	30	Days:	60
Pharm:	JOES PHARMACY #02236	Source:	PBM A
MD/DO:	JEFFRIES, RHONDA		

26

## Prescription History via Claims Data

- Overview of e-prescribing
- Reconciliation in the spotlight
- How it works
- National and regional experience
- Knowledge gaps / research opportunities

27

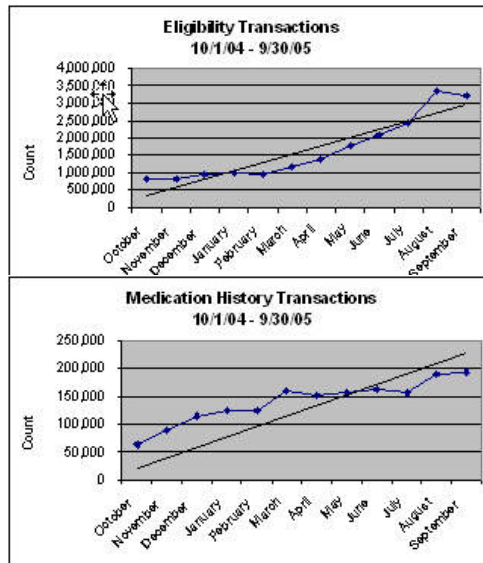
## RxHub Transaction Volume, by Year

	2002	2003	2004	2005*
Eligibility	1,696,381	3,993,101	7,491,437	17,342,767
Med Hx (eRx)	146 (10,000:1)	100,552 (40:1)	416,304 (20:1)	1,415,593 (12:1)
Med Hx (acute)	---	---	65,947	260,180

\* Through end of Sept '05

28

## Elig & Med Hx Transactions Past 12 Months



29

## Evaluative Experience w/ Rx Claims

- > 2M ambulatory care transactions: 0 impact evals
- 300K acute care transactions: early evals only
  - Barnes
  - Regenstrief / IHIE
  - Medsinfo-ED

30

## Medsinfo-ED

**HEALTH  
AFFAIRS**

*The Policy Journal of the Health Sphere*

[Home](#) [Current Issue](#) [Archives](#) [Topic Collections](#) [Search/Browse](#) [Submit](#)

*Health Affairs*, Vol 24, Issue 5, 1197-1204  
Copyright © 2005 by Project HOPE  
DOI: 10.1377/hlthaff.24.5.1197

Implementation

PERSPECTIVE

### **Regulatory And Policy Barriers To Effective Clinical Data Exchange: Lessons Learned From MedsInfo-ED**

**Lawrence K. Gottlieb, Elliot M. Stone, Diane Stone, Lynne A. Dunbrack  
and John Calladine**

MedsInfo-ED is a proof-of-concept clinical data exchange project that uses prescription claims data to deliver patient medication history to emergency department clinicians at the point of care. This patient safety initiative, while

31



MA-SHARE  
MedsInfo ED

A Patient safety initiative to communicate medication history

DOB: 05/22/1923 (M)

Additional Information to assist in validation:  
Card Holder Information

**Jonathan Smith**

Jonathan Smith – ABC Health Plan

123 WASHINGTON ST BOSTON, MA 12345

The medication history displayed may be incomplete--see data limitations below.

Medication History:   Show each drug only once regardless of multiple dispensed dates.

Dispensed	Fills	Name	Dosage/Form	Qty	Class	Prescriber
12/15/2004	5	Doxazosin Mesylate	1 mg tablet	60	antiadrenergic agents, peripherally acting	Not Known
12/15/2004	5	Spiriva	18 mcg capsule	30	anticholinergic bronchodilators	Not Known
12/03/2004	5	Plavix	75 mg tablet	30	platelet aggregation inhibitors	Not Known
12/02/2004	5	Advair Diskus	500 mcg-50 mcg powder	60	bronchodilator combinations	Not Known
12/02/2004	5	Tramadol Hydrochloride	50 mg tablet	60	miscellaneous analgesics	Not Known
11/26/2004	3	Prednisolone Acetate, Ophthalmic	acetate 1% suspension	10	ophthalmic steroids	Not Known
11/02/2004	5	Nitroquick	0.4 mg tablet	100	antianginal agents	Not Known

32

## Lessons Learned (Largely Logistical)

- Patient coverage (e.g., PBM participation)
- Prescription coverage (e.g., OTC, cash)
- Filtered drugs (HIV, mental health, substance abuse)
- Missing allergies, indications, SIG
- Testing barriers (HIPAA)
- Consent workflow
- Technical / transaction standard issues

33

## Prescription History via Claims Data

- Overview of e-prescribing
- Reconciliation in the spotlight
- How it works
- National and regional experience
- Knowledge gaps / research opportunities

34

## Rx Claims & Detection of Non-compliance

### Henry Ford Health System Clinics

- 231 visits with or without 6 months Rx claims (random)
- Mean age 61 yrs; 5.5 drugs per patient
- Abstractor-detected non-adherence: 57% vs. 58%
- MD-detected non-adherence: 30.5% vs. 0% ( $p < .001$ )
- Drug changes: 1.3 vs. 0.3 ( $p < .001$ )
  - Dose changes, drug additions, discontinuations (all  $p < 0.05$ )
- 46% of MDs saved 1-3 min per encounter
  - 3% saved 4-6 minutes

Bieszka, Nella et. al. *Detection of nonadherence through review of pharmacy claims data* Am J Health-System Pharm. 60:360-366, 2003.

35

## Frequency of Incomplete Medication Hx

### The Netherlands

- 304 patients admitted to general internal medicine
  - Mean age 71 yrs
- Compare meds in chart with pharmacy records
  - Resolve discrepancies via patient interview
- Admission records included 1196 drugs
  - Additional 518 in pharmacy records (410 in active use)
- 61% of patients with at least one drug missing
  - 33% with two or more

Lau, H.S., et al., *The completeness of medication histories in hospital medical records of patients admitted to general internal medicine wards*. Br J Clin Pharmacol, 2000. 49: 597-603.

36

## Medications Omitted from History (Lau)

Medication	Use Frequency	Omission Frequency	% Error
Benzodiazepines	121	40	33
NSAIDs	81	31	38
Furosemide	68	11	16
Oral antidiabetics	68	13	19
B-Blockers	57	5	9
Nitrates	56	14	25
ACE-inhibitors	48	6	13
H2-blockers	46	11	24
Digoxin	37	5	14

Lau, H.S., et al., *The completeness of medication histories in hospital medical records of patients admitted to general internal medicine wards*. Br J Clin Pharmacol, 2000. 49: 597-603.

37

## Pharmacist-augmented Medication Hx

### Wichita State (760 bed, tertiary care)

- Pharmacist vs. usual Rx intake (n=100)
  - Pharmacists: 13.4 ± 6.7 minutes on intake interview
  - Nurses: 24.3 ± 19.8 minutes
- Pharmacists improve accuracy of Rx history
  - Clinical intervention 34% vs. 16%
  - Mean intervention per pt: 0.6 vs. 0.22
  - Route/dosage discrepancies (5 vs. 2), therapeutic duplications (3 vs. 0), incomplete/missing (14 vs. 5)
  - Still needed to call pharmacy ¼ of the time

Nester, T and Hale, L. *Effectiveness of a pharmacist acquired medication history in promoting patient safety* Am J Health-System Pharm. 59:2221-2225, 2003.

38

## Benefits: Summary

- Medication histories often incomplete
  - (what you don't know can hurt your patients)
- Pharmacist-augmented histories solve this
  - Only 3% of hospitals have implemented (\$\$\$, labor...)
- Claims history provides low-cost surrogate
- Non-compliance detection: likely substantial
- Efficiency dividend: TBD
- Errors prevented and associated \$\$ savings: TBD

39

## Knowledge Gaps

- Discrepancy analyses
- Impact on non-compliance detection
- Impact on drug treatment decisions
- Efficiency
  - Medication history intake (acute and ambulatory care)
  - Medication list maintenance (ambulatory care)

40

## Ohio Coverage by RxHub MPI (6/05)

MSA	Population	In RxHub MPI	%
Akron	705,940	294,579	41.7%
Canton-Massillon	401,163	141,124	35.2%
Cincinnati, OH-KY-IN	1,230,306	501,507	40.8%
Cleveland-Lorain-Elyria	2,241,254	1,105,331	49.3%
Columbus	1,540,591	911,308	59.2%
Dayton-Springfield	954,267	469,195	49.2%
Hamilton-Middletown	325,819	157,471	48.3%
Huntington-Ashland	62,035	26,666	43.0%
Lima	161,422	77,535	48.0%
Mansfield	179,996	89,001	49.4%
Parkersburg-Marietta	64,513	27,188	42.1%
RURAL OHIO	2,136,206	1,010,350	47.3%
Steubenville-Weirton	76,712	25,927	33.8%
Toledo	614,641	357,818	58.2%
Wheeling	68,610	34,593	50.4%
Youngstown-Warren	589,527	253,551	43.0%
<b>Ohio Total</b>	<b>11,353,002</b>	<b>5,483,144</b>	<b>48.3%</b>

41

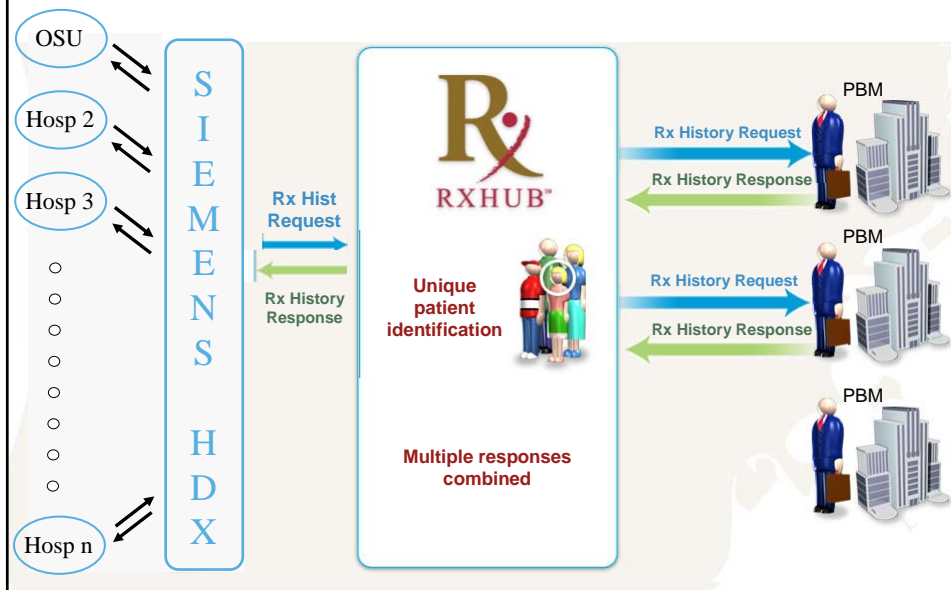
## RxHub MPI Eligibility Hits (Jan->July, 2005)

■ Canton-Masillon	21K	
Cincinnati	52K	<b>MedPlus</b>
Cleveland-Lorain-Elyria	43K	<b>OnCallData</b>
Columbus	9K	
Dayton-Springfield	27K	
Toledo	364K	<b>Allscripts</b>

**Epic is Coming**

42

## Ohio State and Siemens



## Prescription History via Claims Data

- Overview of e-prescribing
- Reconciliation in the spotlight
- How it works
- National and regional experience
- Knowledge gaps / research opportunities

44