Results and Impact of Electronic Prescribing (e-Rx) Use;

3rd teleconference in a series of four on the Medicare Modernization Act e-RX Pilot Evaluation

November 2, 2007

Speakers:

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Vice President, Clinical Affairs and Product Strategy

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NORC at the University of Chicago

ePrescribing Pilot Findings

Ken Majkowski, Pharm D
Vice President, Clinical Affairs and Product Strategy

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Background

- Overview of RxHub
  - Services
- RxHub Experience with Pilot Transactions
  - Metrics
- Pilot Findings and Correlation to RxHub Experience

RxHub Overview

- Founded in 2001 by the three largest PBMs. Resulted in a nationwide ePrescribing information exchange network
- Open to all ePrescribing stakeholders to ensure fastest route to widespread adoption and cost effective healthcare delivery
- Utilizes (and develops) industry transactional standards to securely communicate consenting patient information in real-time between ePrescribing stakeholders (ASC X12, HL7, and NCPDP)
- Provides clinical decision support information - patient eligibility, benefits, formulary, and medication history - for more than 160 million patients to physicians at the point-of-care (access to more than 200 million patients are under contract)
- Delivers real-time, informed electronic prescriptions to pharmacists in the retail and mail order settings
- RxHub does not alter clinician/patient relationships, or business relationships between payers, pharmacies, and technology vendors
- Cost Recovery Model

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RxHub Success Factors

- Delivering Value – Payer Centric Model
  - Leverage assets to deliver value to all Stakeholders
- Unique Products & Services
  - **Master Patient Index (MPI)**
  - **PRN (Eligibility, Formulary & Benefits, Med History)**
  - **SIG (NewRx, Refill/Renewal, Change, Cancel, Fill Status)**
  - MEDS (Med History for the acute care setting)
  - Pharmacy Benefit Eligibility at the point of dispensing
  - RxHub Integration Services

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RxHub Services

- ***Person Index:*** Provides real-time access to more than **180M** members uniquely identified using demographic elements (over 200M under contract).
- ***Patient Eligibility:*** Provides real-time access to patient eligibility, benefit and coverage, and formularies for authorized clinicians at the point of care. Patient eligibility is also available to pharmacists at the point of dispensing.
- ***Patient Medication History:*** Provides real-time PBM drug history for all patient coverages and includes original prescription and refills. Data can be used to indicate patient compliance, therapeutic interventions, drug-drug and drug-allergy interactions, adverse drug reactions, and duplicate therapy. This information is available for outpatient, inpatient and emergency departments**.**
- ***Patient Prescriptions:*** Provides bi-directional electronic delivery of prescriptions between physicians and pharmacies of the patients choice (retail, mail order and Long Term Care).

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RxHub Participant Activity YTD – October 2007

RxHub MPI
RxHub National Patient Health Information Network™ provides access to more than **180M** covered lives in the US

RxHub PRN/SIG
Ambulatory
115M Eligibility & Benefit Requests
11M Medication History Profiles Delivered
999K New/Refill Prescriptions delivered to Retail/Mail

RxHub MEDS
Acute Care
2.5M Medication History profiles delivered

Payers/PBM Partners

ACS
Aetna
Argus
Care First
Humana
Independence Blue Cross
Regence
BCBS Florida
BCBS Illinois
BCBS Minnesota
CAQH
CVS Caremark
PharmaCare
EDS
Express Scripts
First Health
MC-21
Medco Health Solutions
Presbyterian Health
RESTAT
SXC
Independent Health
MedMetrics
WellPoint

Technology Application Partners

Achieve Healthcare
Allscripts
Touchworks
eRx Now
HealthMatics
Athena Health
Axolotl
Bond Medical
Catalis Health
Cerner
Chart Connect
Community Computer
DAW Systems
DrFirst
eClinical Works
eHealth Solutions
ElectroMed
Emdeon
EPIC
ePocrates
First Point
Gold Standard
H2H Solutions
Health Vision
InstantDx
iScribe
MA Share
Caregroup
McKesson
RelayHealth
Practice Partner
MDOffices
Medical Info Sys
MedicWare
MedKeeper
MedPlus
Medport
Misys
NewCrop
NextGen
OA Systems
Phytel
Prematics
Pulse Systems
Regenstrief INPC
RxNT
SafeMed
SAGE
ScriptRx
Sequel Systems
SSIMED
STI Computer
Synamed
Virtual Medical Network
Waiting Room Solutions
Zix Corporation
Zynchros

Network Pharmacies

Caremark Mail Order
eRx Network
Express Scripts Mail Services
Medco Mail Order
PharmaCare
RNA

Hospital Distributors

DB Motion
DrFirst
GE Healthcare
Healthcare Systems
InterMedHx
Patient Keeper
Quovadx
Regenstrief Institute
Siemens Healthcare

Emergency Preparedness

*** ICERx.org**

BOLD - Participant in production
ITALICS - Participant in certification
NORMAL - Participant contracted
* - Participant used in declared emergencies

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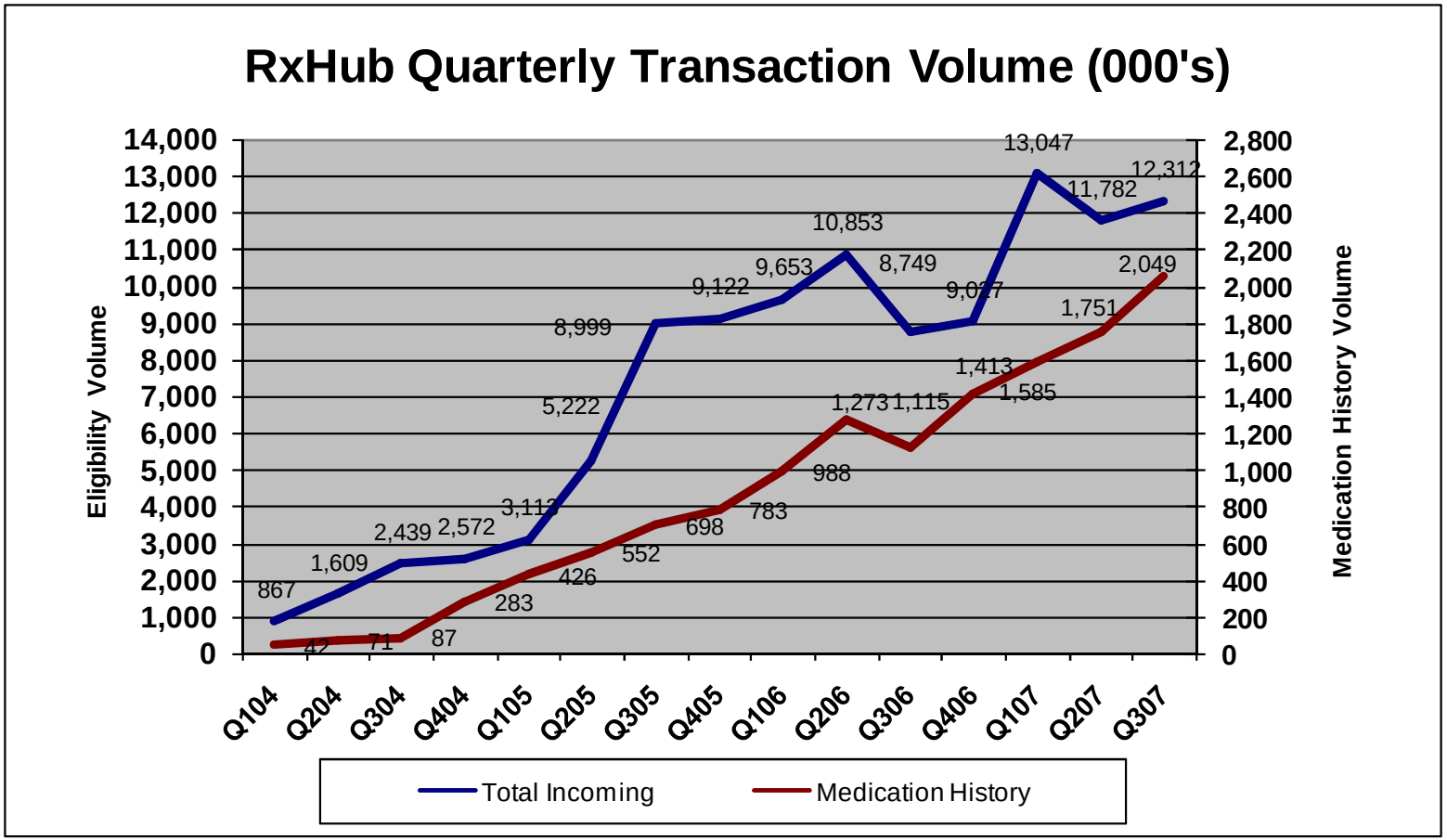

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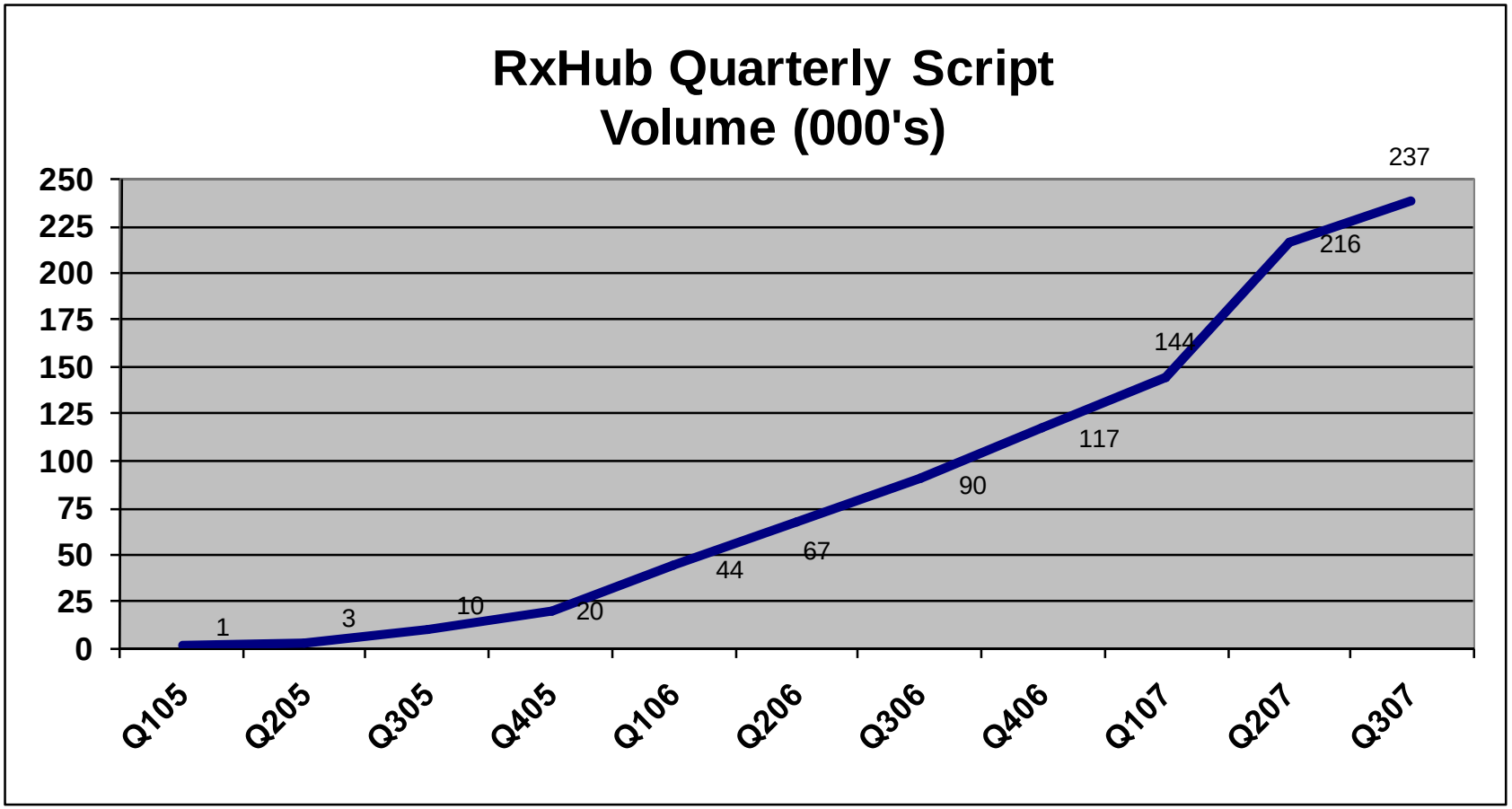

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ePrescribing Pilot Participants

Long Term Care e-Rx Standards Pilot Study - Minneapolis

- Participants: Achieve Healthcare Technologies, Benedictine Health System (BHS), Preferred Choice Pharmacy (PCP), RNA Health Information Systems, RxHub, BCBS Minnesota, Prime Therapeutics, MediMedia

New Jersey E-Prescribing Action Coalition

- Participants: Horizon Blue Cross Blue Shield of NJ, Caremark Rx, iScribe, Allscripts (TouchWorks), RxHub, SureScripts, UMDNJ, Point of Care Partners, RAND Health

Ohio KePRO

- Participants: UPCP + Ohio KePRO, InstantDx (OnCallData™), NDCHealth (Per-Sé), RxHub, SureScripts, QualChoice, Aetna, MGMA Center for Research, Univ. of Minnesota Division of HSR, Wellpoint/Anthem, Aetna, Medical Mutual of Ohio, Wolters Kluwer Health, Partners Health Care, RAND Corporation

The ePrescribing Gateway - Massachusetts

- Participants: Brigham & Woman's Hospital, Partners Healthcare, Beth Israel Deaconess Medical Center MAShare, CSC Consulting, BCBS Massachusetts, Express Scripts, SureScripts

SureScripts – Florida, Massachusetts, Nevada, New Jersey, Tennessee

- Participants: Brown Medical School, Allscripts, MedPlus, DrFirst, Gold Standard, ZixCorp, Ahold, Albertsons, Brooks, CVS, Duane Reed, RiteAid, Walgreens, Wal-Mart, Kerr Drugs, Longs Drugs, Midwestern University, Chain Pharmacy Advisory Council, Independent Pharmacy Advisory Council

Outcomes to Discuss

- *Formulary versus Generic Prescribing*
- *Medication History Utilization*
- *Inappropriate Prescribing/Adverse Drug Events*

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Standards

- Initial Standards
  - **Formulary and Benefit**
  - **Medication History**
  - Fill Status
  - Prior Authorization
  - Structured & Codified SIG
  - RxNorm
- Foundation Standards
  - **Eligibility**
  - **SCRIPT**
  - Telecom

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Formulary & Benefits Findings

- Analysis shows that this standard is technically able to convey the information needed to support this function for use in Part D
- Implementation issues
  - Matching patients to health plans
  - As more Health Plans participate, Eligibility information will be more readily available

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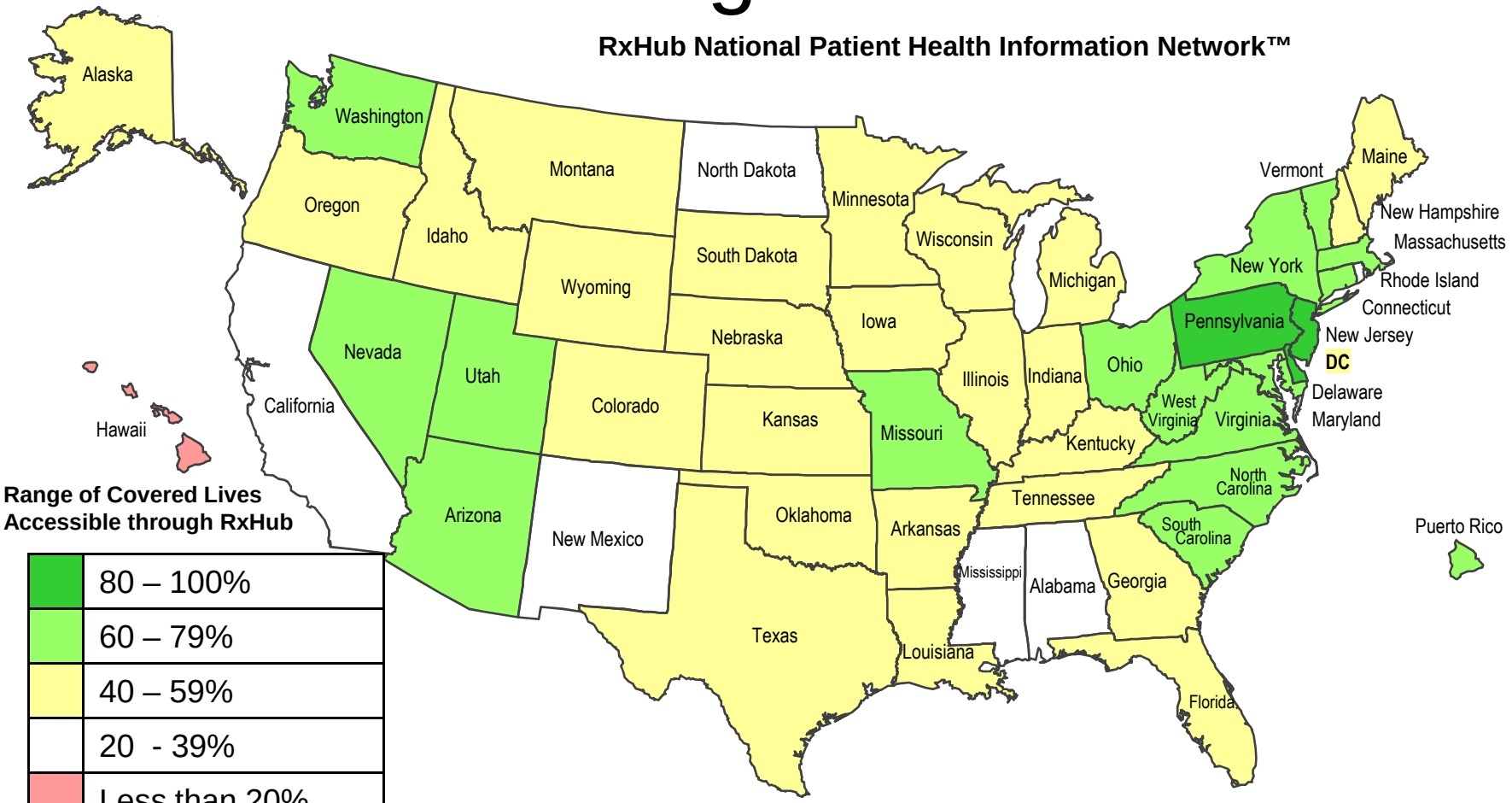
RxHub Master Person Index Coverage – October 2007

RxHub National Patient Health Information Network™



Range of Covered Lives Accessible through RxHub

	80 – 100%
	60 – 79%
	40 – 59%
	20 - 39%
	Less than 20%

Note: Does not include lives under contract

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ePrescribing Case Studies

- The ePrescribing experience of Henry Ford Health System exceeded their expectations.
  - More than 2,100,000 prescriptions have been sent electronically to date with the following impact:
    - Over 80,000 were changed due to formulary messages
    - Over 200,000 were changed due to interaction warnings
    - Over 15,000 were changed due to drug allergy warning
    - The generic usage rate improved from 56.7% to 70.5%

- AETNA ePrescribing experience with Zix in New Jersey
  - 5 to 7 % increase in generic prescribing

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Medication History Findings

- Analysis shows that this standard is technically able to convey the information needed to support this function for use in Part D
- Standard is relatively mature, widely adopted
- Useful for preventing medication errors and for understanding medication management compliance
- No one source provides a comprehensive listing of medications
- Underutilized by physicians
  - Believe the information is not complete enough to provide real value
  - Unaware information was available
- Need to reconcile data from multiple sources

Summary - Med History Focus Group Findings

- Medication history is underused in practice today, even by physicians who prescribe electronically. Most physicians were unaware that external med history was or could be available to them
- Physicians recognize that med history does or can provide them with very useful information and, as such, could contribute to efficiency and quality
- In general, physicians want basic med history lists (drug prescribed) with ability to drill down for additional information
- Physicians would like to have the capability to tailor functions for particular types of patients or drugs
- No consensus on ideal workflow for using med history
- Physicians need to be led in adoption of med history—they are not asking for it but appreciate its value once they see it
- Physicians think that pharmacy claims history have a 6 to 12 week latency like medical claims

Long Term Care Findings

- Analysis shows that ePrescribing can be supported, with some technical accommodations to the standards, in long-term care facilities for Part D implementation
- Exempted from testing interoperability with foundation standards
- Did not test medication history
- Provided 43% patient coverage using patient eligibility – much higher than anticipated
- No changes to Formulary and Benefit standard – works as designed
- Modifications needed to SCRIPT 8.1 foundation standard to support LTC

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Outcomes

- *Formulary versus Generic Prescribing* – the role of ePrescribing in the use of on-formulary medication and generics is still very preliminary, with prescribers uncertain about the accuracy and completeness of formulary information
- *Medication History Utilization* – providers may have been unaware of the availability of this function and comments ranged from a perception of medication history as inaccurate, to those who viewed it as a good supplement to patient self-reporting
- *Inappropriate Prescribing/Adverse Drug Events* – data may demonstrate a potential decrease in medication errors, with many respondents indicating they overrode drug-drug interactions at least sometimes
- *Callbacks* – anecdotes indicate that especially in long-term care, callbacks were dramatically reduced but in another pilot site's survey, no significant differences were noted

Conclusion

- Electronic prescribing is still in its infancy
- Pilot sites demonstrated potential for effective standards-based implementation of three of the initial standards
- Additional work to be done on remaining three for Part D recommendation
- Implementation issues still remain
  - Should be addressed through industry stakeholder input into the established process leading up to the issuance of final ePrescribing standards

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Conclusion

- Pilot project impacted by…
  - Limited amount of time granted to recruit grantees/contractor and conduct pilot site activities
  - Small size of the pilot sites which may or may not represent a statistically significant sample
  - Ability of the grantees/contractor to recruit the right set of participants to make the outcomes meaningful
- Majority of practices consist in size of one or two physicians
  - Adoption of ePrescribing may be slower
  - Requirements for support will be higher than physicians in larger offices
- Large physician offices more likely to deploy ePrescribing along with other HIT systems
- Continue to work with industry, standards setting organizations and other interested stakeholders to fully adopt and implement electronic prescribing in order to reap its many potential benefits

Thank You

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Studies of E-Prescribing Adoption and Use in the New Jersey E-Prescribing Action Coalition

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Point of Care Partners

HEALTH

Medicare Modernization Act

- Established prescription drug benefit
  - Concerns raised about costs and safety
- E-prescribing goal: "Deliver information to the point of care that enables more informed decisions about appropriate and cost effective medications."
- Part D plans required to accept electronic Rx
  - 2006: Pilot testing of "initial" eRx standards
  - 2007: HHS reports to Congress, e-prescribing NPRM
  - 2008: E-prescribing final rule of additional standards
  - 2009: Final standards effective no later than one year after promulgation of final rule

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Conceptual Model

- Structure of the standard

↓ enables

- Information display / capture at prescriber

↓ enables

- Changes in work processes

↙ produce ↘

- Changes in drug use
  - – Appropriateness
  - – Costs
  - – Patient adherence
- Other effects
  - – Labor and other costs
  - – Health service use
  - – Patient satisfaction

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New Jersey E-prescribing Action Coalition

- **Horizon BCBSNJ "E-Prescribe" program**
  - Targeted enrollment of 1000 MDs
  - Paid for installation, training; honorarium for use
  - Caremark - *iScribe*
  - Allscripts - *TouchWorks*
  - InstantDx - *OnCallData*

- RxHub
- SureScripts

- Point of Care Partners
- UMDNJ
- RAND

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Methods: Adoption and Use Analysis

- Adoption (as of July 1, 2006)
  - E-prescribing primary care physicians who activated January – December, 2005
    - Characterize based on assigned patient panel
    - 6 full months of post-activation records
    - iScribe users only; Allscripts, InstantDx installation didn't begin until 2006
  - Comparison: Primary care physicians who hadn't enrolled in e-prescribing as of July 1, 2006
- E-prescribing usage ratio

$$\frac{\textbf{Count of e-prescriptions MD wrote in period}}{\textbf{Count of Rx claims from MD in period}}$$

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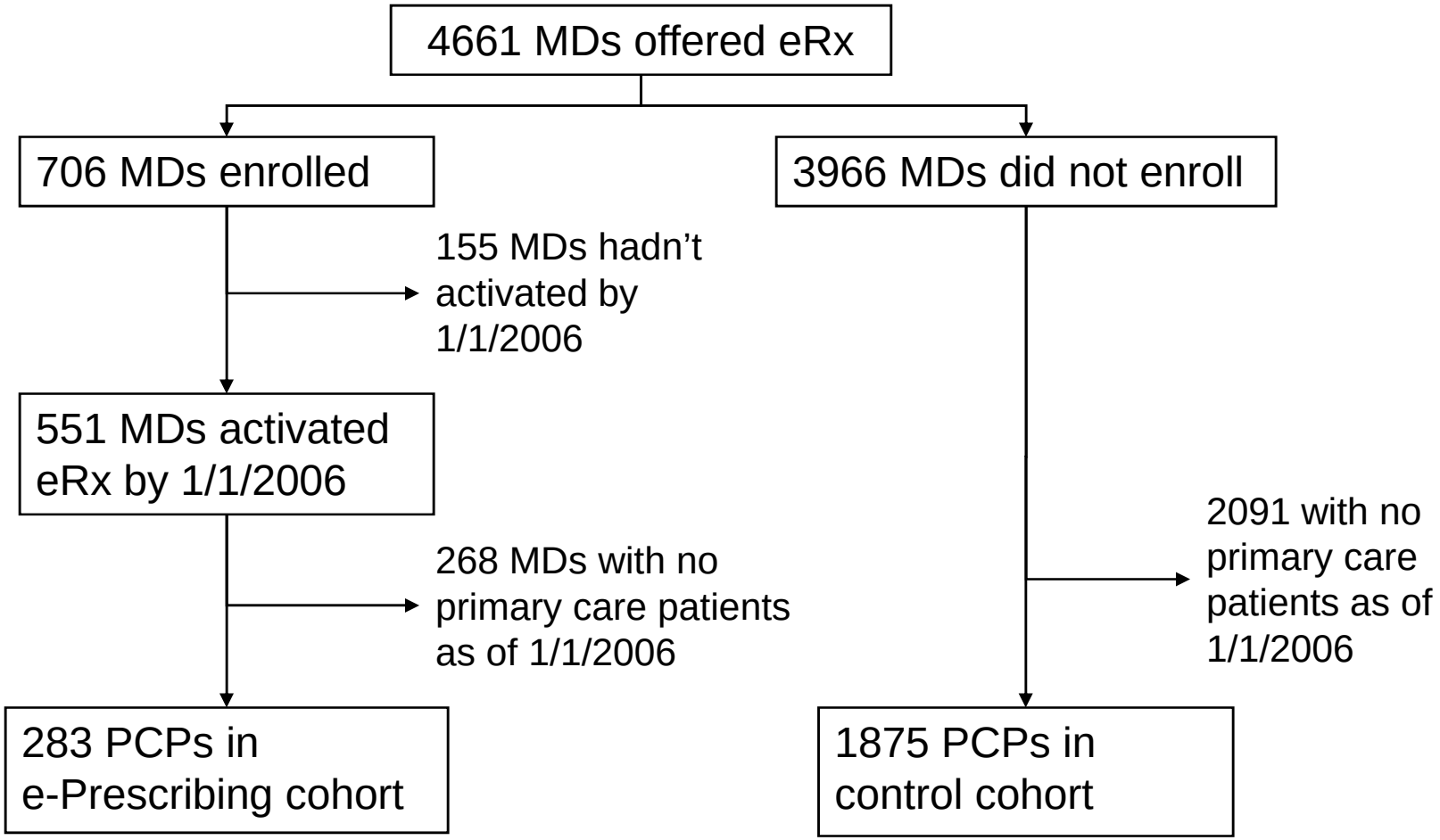
Enrollment and Activation



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Factors Associated with Participation

PCP Characteristics	Odds Ratio	95% CI	P value
Practice Size			
2-5 physicians	1.9	1.4 – 2.5	<0.0001
6-10 physicians	1.6	1.0 – 2.5	0.04
>10 physicians	1.2	0.3 – 4.1	0.78
HBCBSNJ Rx Claim Volume			
Low (< 1750/yr)	0.7	0.5 – 1.0	0.05
High (>3500/yr)	1.1	0.8 – 1.5	0.45
Patient Race			
>10% of patients from predominantly black neighborhoods	0.7	0.4 – 1.0	0.03

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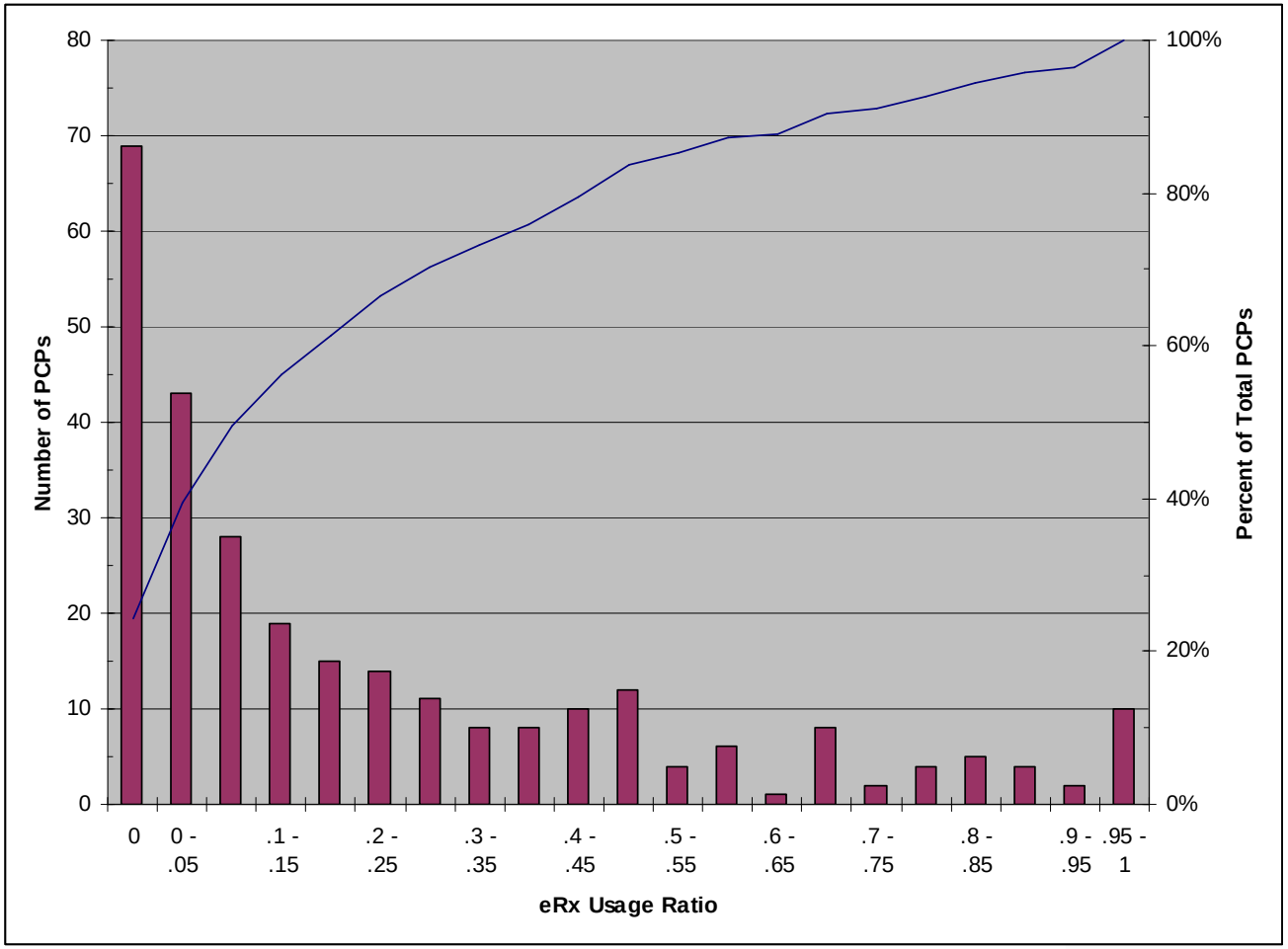
E-Prescribing Usage

- 283 e-prescribers' usage ratios for 2006



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Factors Associated with eRx Use

- Average 2006 usage ratio: 0.24

	Coeff	(95% CI)	*P*
Practice Size			
2 – 5 physicians	-0.01	-0.09 – 0.07	.74
6 – 10 physicians	-0.14	0.04 – 0.24	<.01
11+ physicians	-0.15	0.01 – 0.29	.03

  - Not significant (excluded from model):
    - MD specialty, Rx claim volume;
    - Patient panel mean age, gender, income, neighborhood race-ethnicity

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Methods: Qualitative Case Study

- Purposive sample of 12 practices scheduled to install iScribe or Allscripts
- Site visits before and 3 months after eRx
  - Observation of physical environment, organizational culture, prescription workflow.
  - In-depth interviews of physicians, office managers, and office staff involved in prescription workflow.
- Qualitative Analysis
  - Transcripts coded using ATLAS.ti.
  - Identified themes using a template organizing style.

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Case Study Results

- Of 12 practices where baseline site visits completed
  - 2 cancelled installation
  - 2 successfully installed but quit using eRx
  - 8 installed and still using eRx
    - Of these, only staff were still using at 2

Unsuccessful site

- 6-physician family medicine office, 11 non-MD staff

MD champion:

- “We went online Friday, I tried on Saturday, it worked. I tried at 9 am Monday, it didn’t work. We contact them and they called us 2 weeks later on Monday. So, the momentum was gone.”
- “I write the name and 6 prescriptions on one (sheet). And I can actually do that quicker. So I realized that it wasn’t gonna be a time improvement. I was torn, but then I thought, you know, I just can’t devote the time to become the expert I have to be to make it work flawlessly.”

Successful site

MD user:

"It's made me a lot (quicker). After the uh, growing pains of getting used to how it worked (and the) initial bugs, and especially after (preferences) were in there … I didn't have to put in the amount-the dosing, 'cause it saves those configurations for you

"the one or two days lately when, for whatever reason, I couldn't use it, I really felt how much (paper) was slowing me down…

"I think it's increased patient satisfaction. You know, patients really like it. They think it's very cool. Once in a while, the prescription doesn't go through, but they don't get angry or upset 'cause I think they understand that, in the past, they always had to go to the pharmacy twice-to drop it off, and then to go get it.

Shifts in Work

- Solo OB/Gyn, 3 staff; physician only user
- **RN:** “His handwriting is atrocious and (I) was inundated with calls from the pharmacy about it before… (E-prescribing) has cut down on calls about handwriting.”
- **MD:** “(I’m now) doing more of what the nurse used to do with regard to prescriptions.”
  - Now approves and sends renewals using the PDA himself, vs. approving a telephone message and handing it back to the nurse to call in

Methods: Prescriber Survey

- Sample
  - 395 physicians who enrolled for eRx & had working email address
    - 236 iScribe or Allscripts users
    - 159 waiting list
- Data collection
  - Lead letter, email invite, telephone reminder
  - Online survey instrument

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Overall Experiences with E-prescribing

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The e-prescribing system is easy to use	3%	9%	6%	58%	24%
I use e-prescribing for most of my prescriptions	6%	15%	16%	26%	38%
E-prescribing has made work easier for my staff	5%	13%	33%	25%	25%
E-prescribing has made my work easier	6%	16%	24%	32%	23%
Using e-prescribing improves the quality of care I can deliver	5%	14%	2%	38%	24%
Using the e-prescribing increases my productivity	7%	24%	28%	22%	19%
The system does not require a lot of mental effort	3%	13%	23%	45%	16%

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Conclusions

- E-prescribing holds promise
  - Perception of increased safety and efficiency
    - Despite technical problems, poor functioning of standards
  - May save staff time more than prescriber time
- E-prescribing was substantially under-used
  - Yet a minority of e-prescribers achieved high use
  - Major predictors of high use not identified
- Future priorities
  - Identify workflow & training strategies to promote use
  - Improve technical functioning

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Maximizing the Effectiveness of E-Prescribing Between Physicians and Community Pharmacies: Implementation

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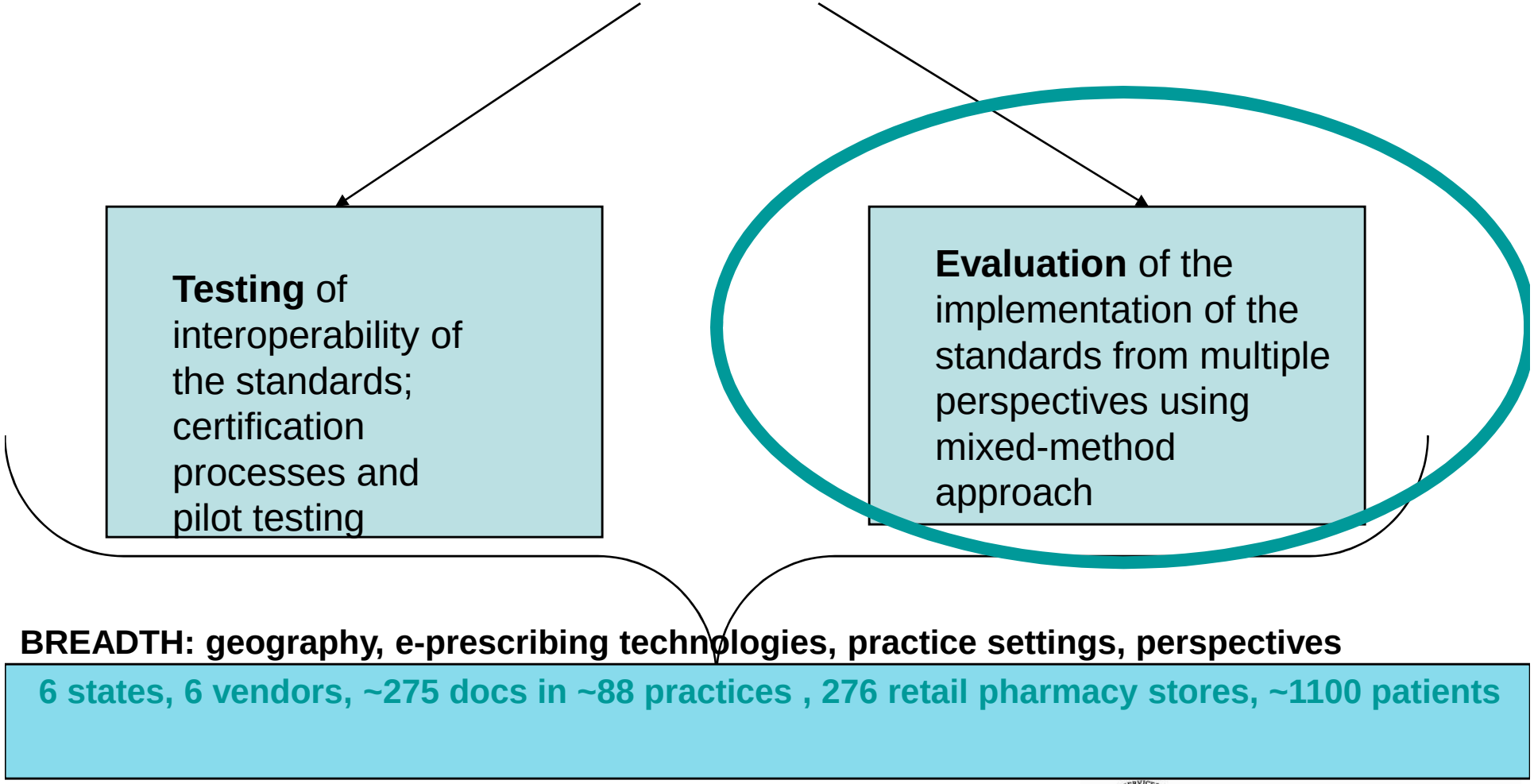
OVERVIEW

OBJECTIVES OF THE PROJECT



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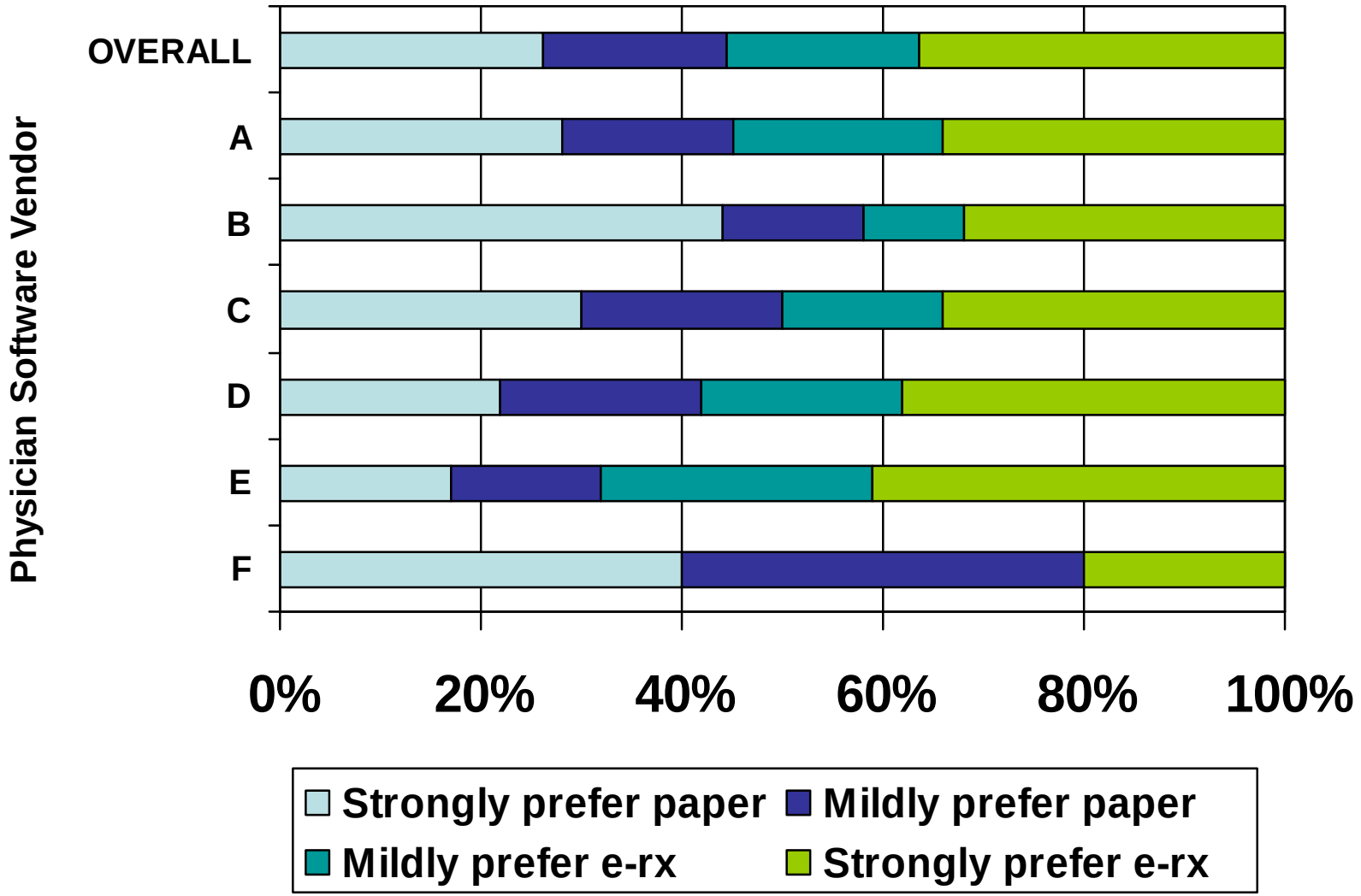
Evaluation Strategies:

- **Mixed-method approach**
  - Qualitative methods:
    - Focus groups
    - Performance analyses (on-site observation) – physician practice only
  - Quantitative
    - Survey
      - Providers (physicians and other prescribers, pharmacists and pharmacy techs)
      - Patients
    - Documentation of interventions (pharmacy)

Patient Perspectives

Variation in patient preference for e-prescribing



Physician comments on patient preference

- “They love it. Even when we hated it in the beginning … the patients loved it. They were--they go there, it's ready for them. As opposed to going there… waiting in line, dropping off the thing and, okay, come back in forty minutes.”

- “Oh yeah they like it... There's – ‘Oh, that's cool; my doc is high tech.’ … So it's usually a positive thing unless they've had (a bad) experience -I've had patients where I go to pull out the PDA, and they go, ‘Oh no, not that thing; that didn't work last time.’”

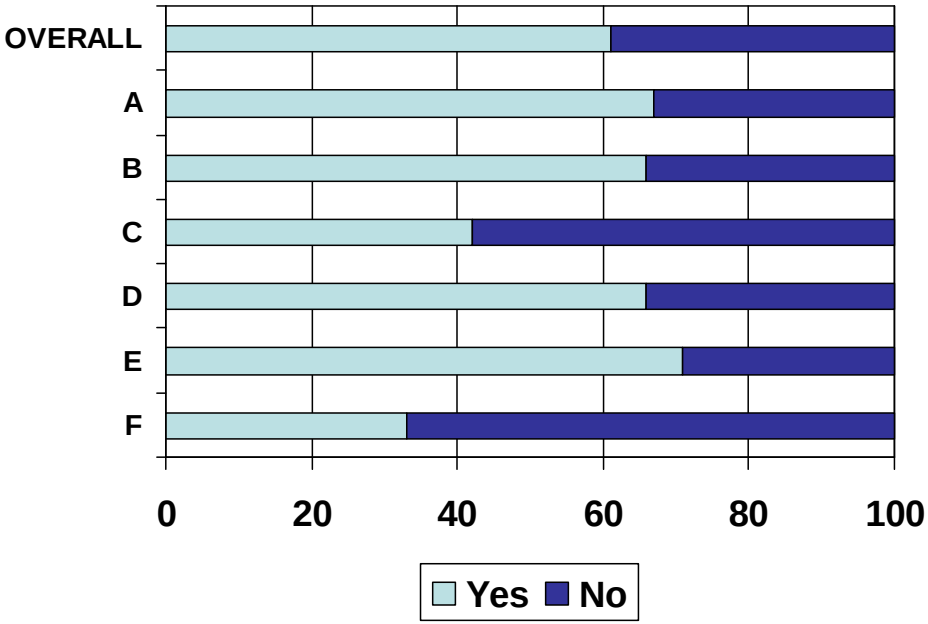
- “And then it doesn’t happen, and the patient gets pissed off… It happened to me--was it--Saturday night. I sent it from home and then continued to get calls from an irate patient every hour that it's not going through. And I knew I did it.”

- “So then that makes it difficult because then the patients don't want us to do it, you know, to prescribe electronically.”

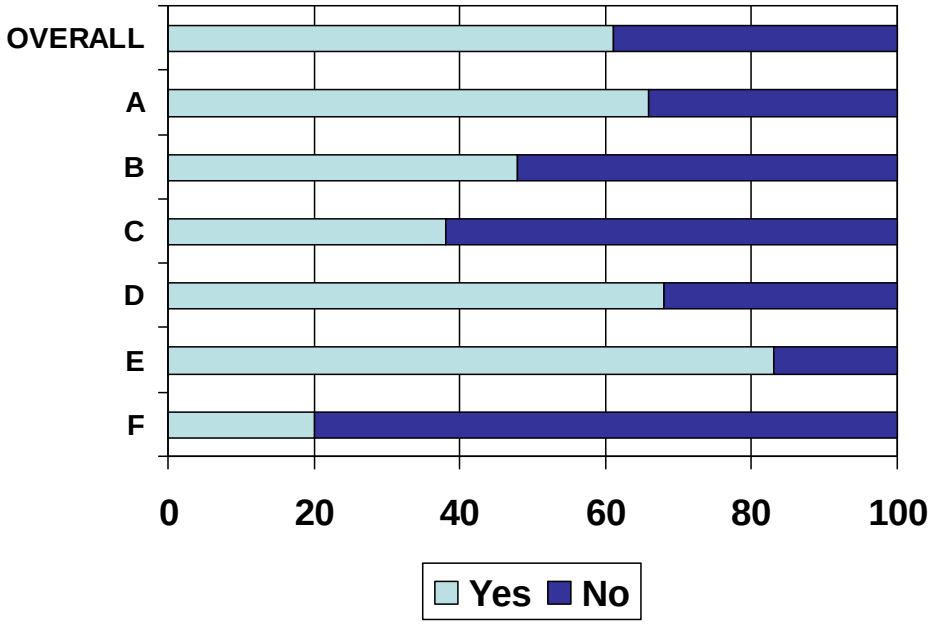
Patients knowledge about e-prescribing

FINAL

Does patient know practice uses e-prescribing?



Has patient ever had an e-prescription?



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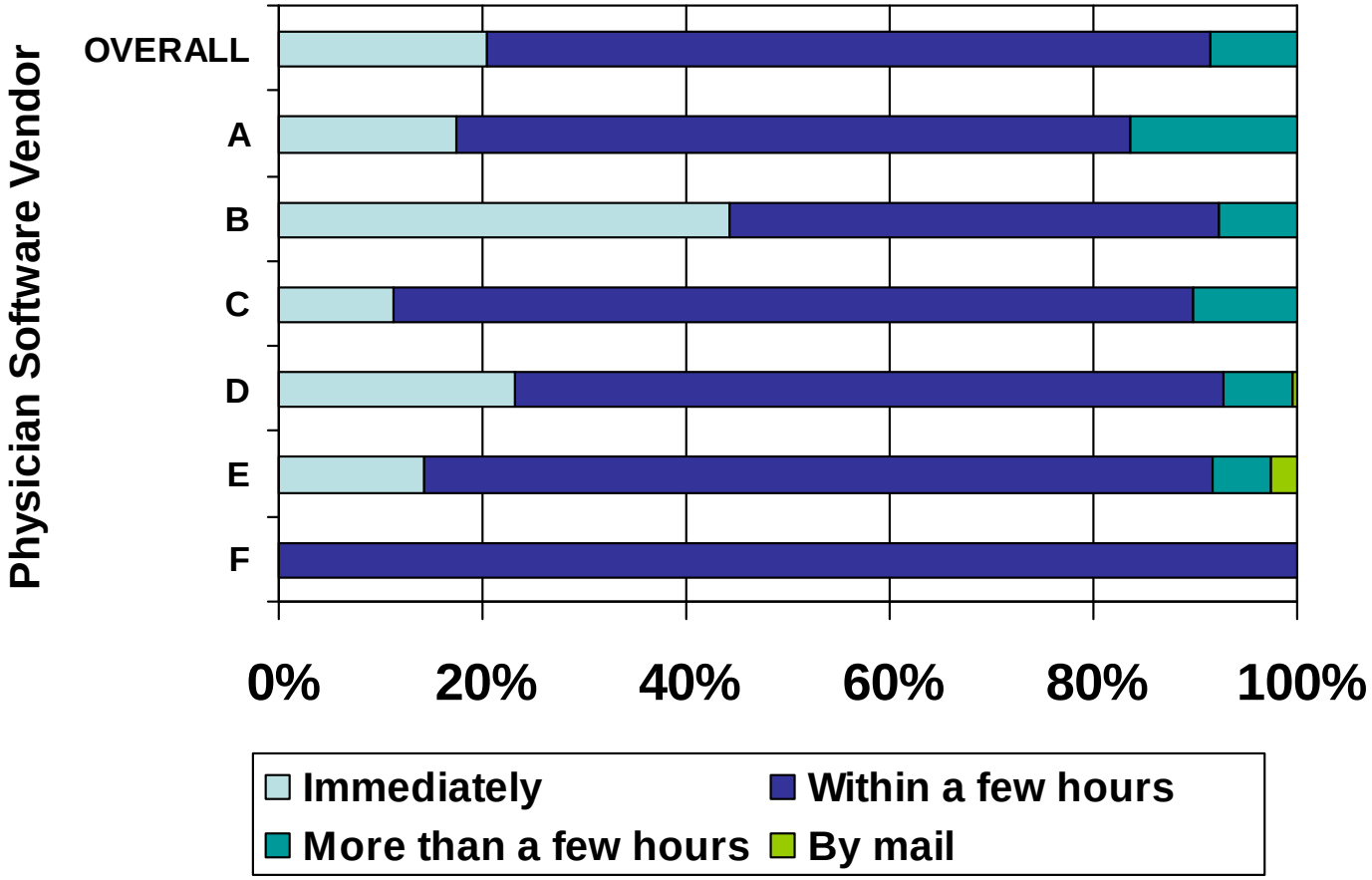
Physician comments on consistency of e-rx use

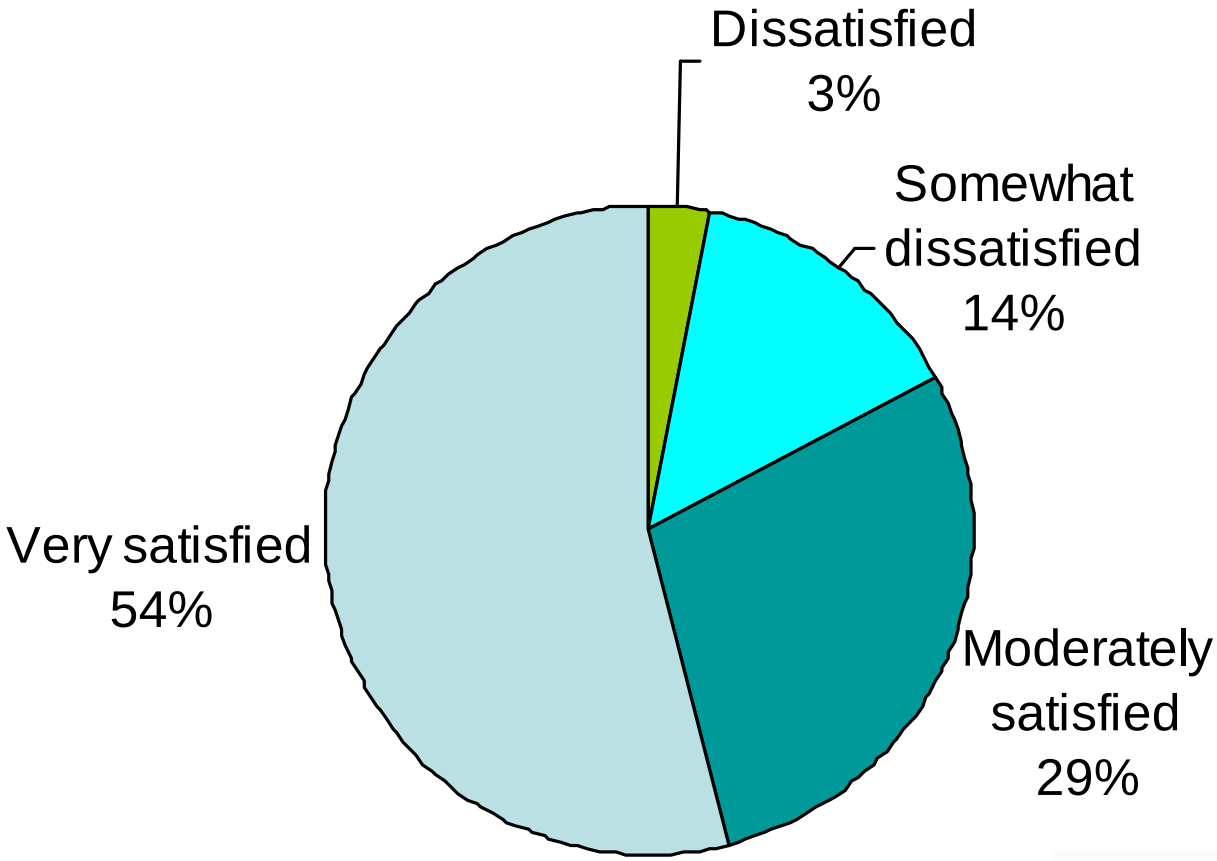
- “I think it is a big statement that we have changed our practice styles so much that it is now rare for me to write a prescription by hand.”
- “If I see a patient, it's still easier for me to sit there with my prescription pad because I don't have a computer in my exam room…. If someone … calls in and says I need a prescription … I'll have the nurse… enter it into the system… and I can just signoff on that.”
- “I can't do all (e-prescriptions)--I see six patients an hour, and I cannot do all my patients on that. I have to do some written scripts, or I'll be really backed up.”
- “When they say they need potassium, I just pick up the phone and call rather than get on the [product name], log on [product name]... It's faster for me usually just to call.
- “Once in a while a patient will call me with a problem, and I'll just right off the bat I'll just call the pharmacy and call in a prescription for them.”

Patient expectations of prescription readiness



Patient satisfaction with e-prescribing as dispensed at pharmacy

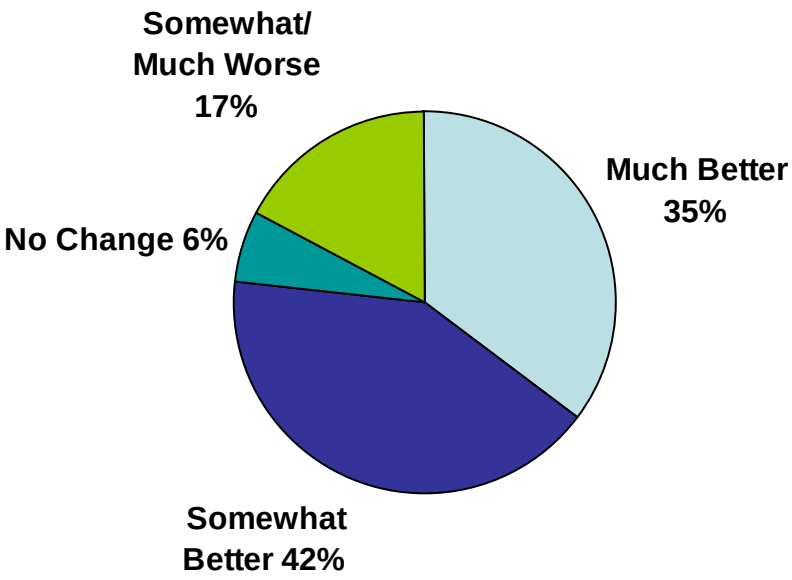
FINAL



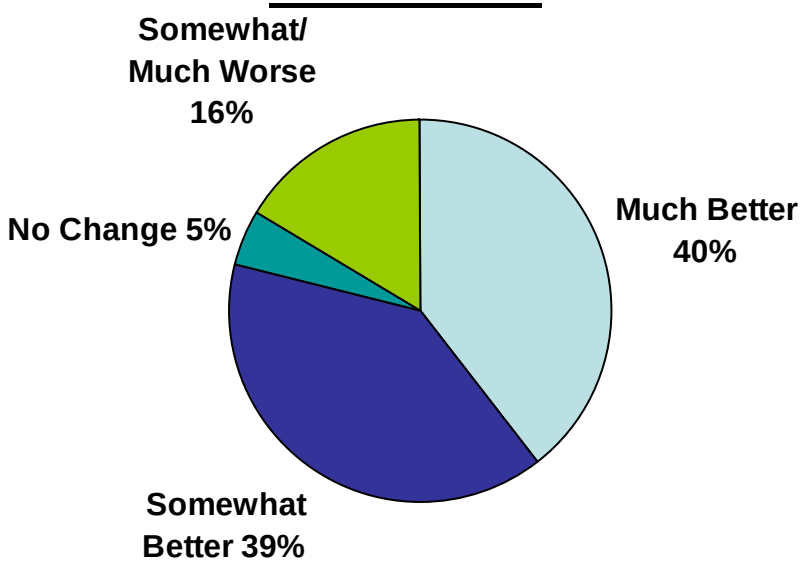
Clinician perspectives

How use of e-prescribing software has affected job compared to other methods

Clinicians



Non-Clinicians



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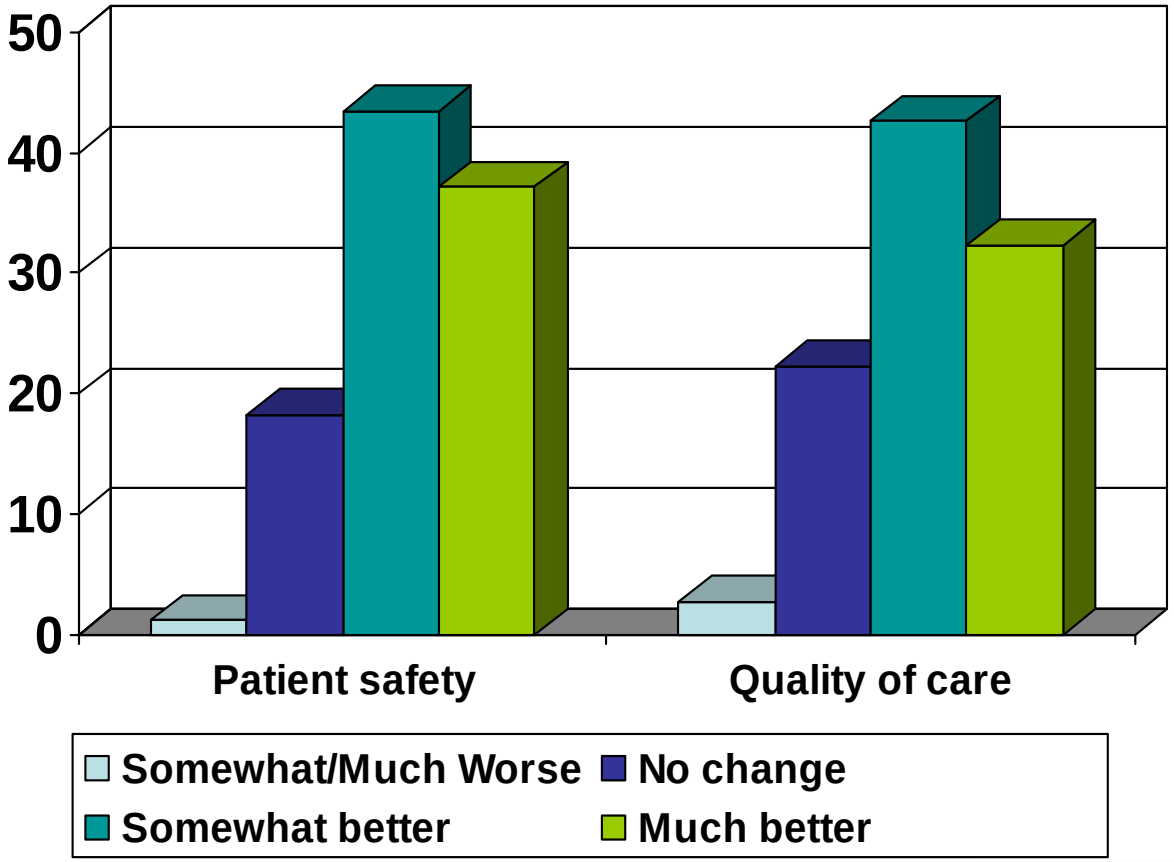
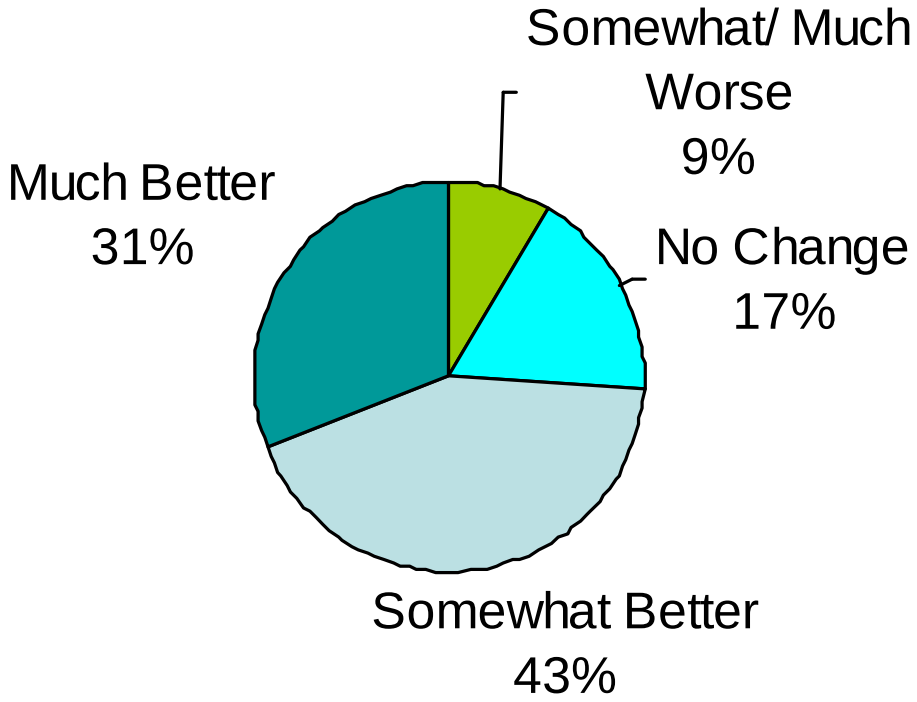
FINAL

Perceptions on how e-prescribing has impacted quality and safety



E-prescribing compared to other methods in terms of communication w/ pharmacies



Pharmacy relationship

- “Well I think it's been good in the aspect that my scripts can be read by the pharmacy. I think they're thrilled with it.“

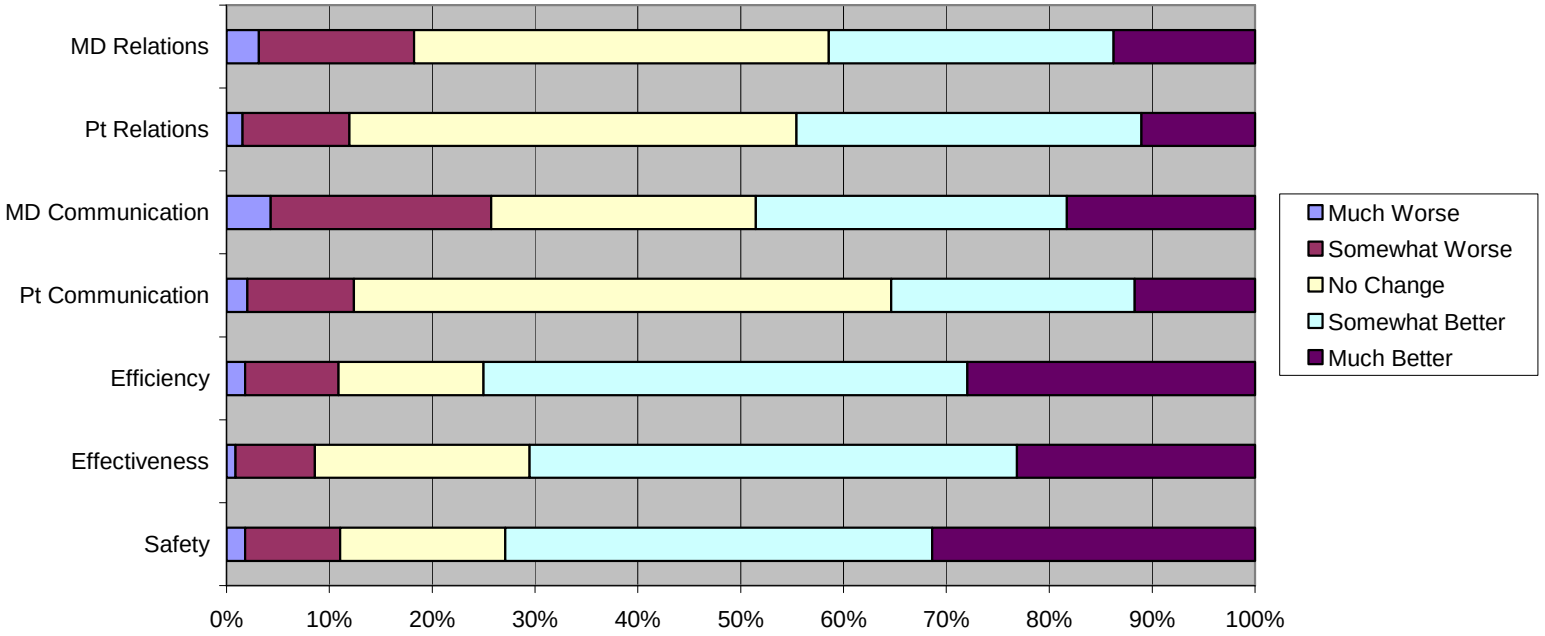
- “(Access to formulary and benefit information) saves us a lot of callbacks. Example, if the brand name is not covered at all but the generic is, you just automatically write the generic.”

- “Less time on the phone with the pharmacist… yeah, phone and time costs with the nurses in terms of they're not spending too much time on phones. They do it on a computer. It's just quicker.”

Pharmacy perspective

Pharmacist perceptions

How eRxs Compare: Pharmacists (n=446)



	Safety	Effectiveness	Efficiency	Pt Communication	MD Communication	Pt Relations	MD Relations
Much Better	31.4%	23.1%	28.0%	11.7%	18.3%	11.0%	13.7%
Somewhat Better	41.5%	47.4%	47.0%	23.6%	30.2%	33.6%	27.7%
No Change	16.0%	20.9%	14.1%	52.3%	25.7%	43.5%	40.3%
Somewhat Worse	9.3%	7.7%	9.1%	10.4%	21.4%	10.4%	15.1%
Much Worse	1.8%	0.9%	1.8%	2.0%	4.3%	1.6%	3.2%

RUPP M, JACKSON T.

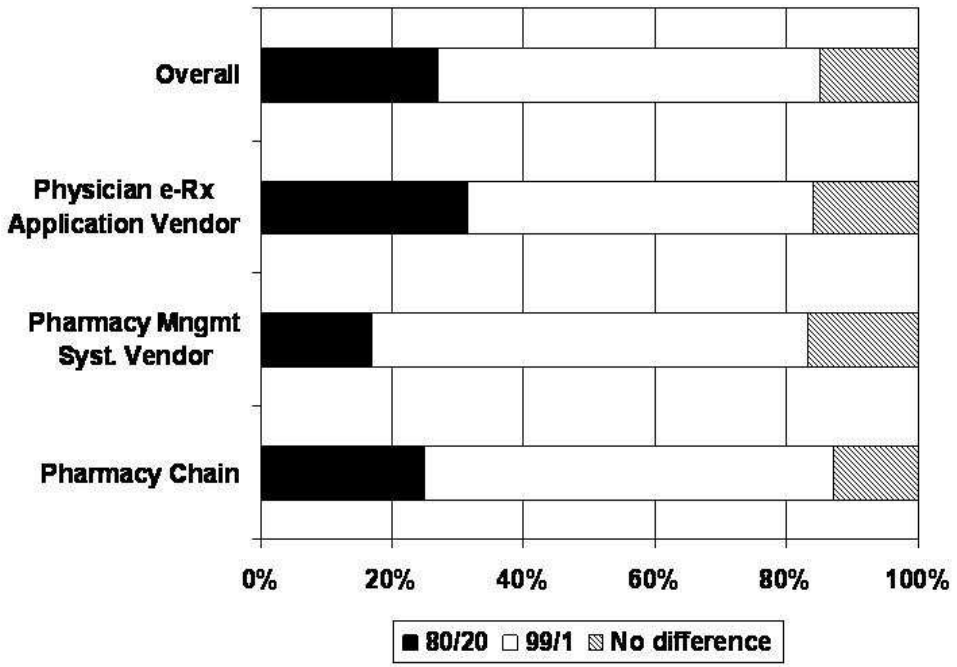
More work to be done…..

- **Pharmacists intervene 3.8% of e-Rx**
- **The need for codified SIG clear**

Warholak T, Rupp M. Medication Therapy Intervention Study.

Industry perspective: Codified SIG

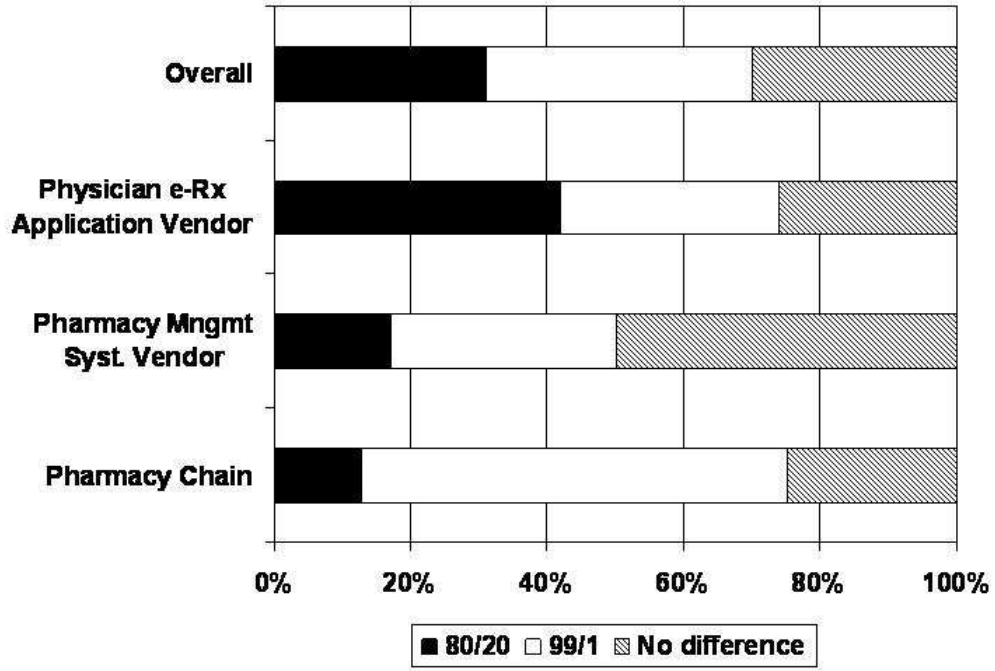
Figure D2b. With respect to Structured and Codified Sig Formats, which approach is more likely to reduce the number of errors related to patient instructions that occurs in e-prescribing?



Clear perceptions of safety gains with 99/1 proposition

Industry perspective: Codified SIG

Figure D2c. With respect to Structured and Codified Sig Formats, which approach is more likely to reduce the number of calls between pharmacies and prescriber offices?



Favors 99/1 proposition to reduce callbacks

SUMMARY

- Just because a practice has e-Rx capabilities….
  - Not all clinicians within the practice e-rx
    - Training issues
    - Lack of understanding of benefits
  - Not all clinicians use e-rx with all patients
  - Not with all prescriptions
    - Regulations (scheduled drugs)
  - Not all functionalities of e-Rx

Summary

- Overall perspectives from patients, pharmacy, and clinicians optimistic
- More work needs to be done:
  - Less than optimal use of functionality
  - Reducing errors– Need codified SIG
  - Reducing use of multiple prescribing systems in practices
- Untapped potential?
  - Engaging:
    - Pharmacists – med history at point of dispensing?
    - Physicians – using med history in practice
    - Patients – e-rx tools to improve medication management

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Warholak T, Rupp M. Medication therapy interventions on e-prescriptions. (in preparation)

Lapane KL, Waring ME. Medicare Part D implementation: Lessons learned (in preparation)

Northeast Ohio CMS eRx Project

Workflow Findings

AHRQ eRx TeleConference, 11/2/ 07

Bob Elson, MD, MS (bob.elson@eclipsys.com)
Chief Medical Officer, Eclipsys Corp.
MetroHealth Center for Healthcare Research and Policy

http://healthit.ahrq.gov/erxpilots

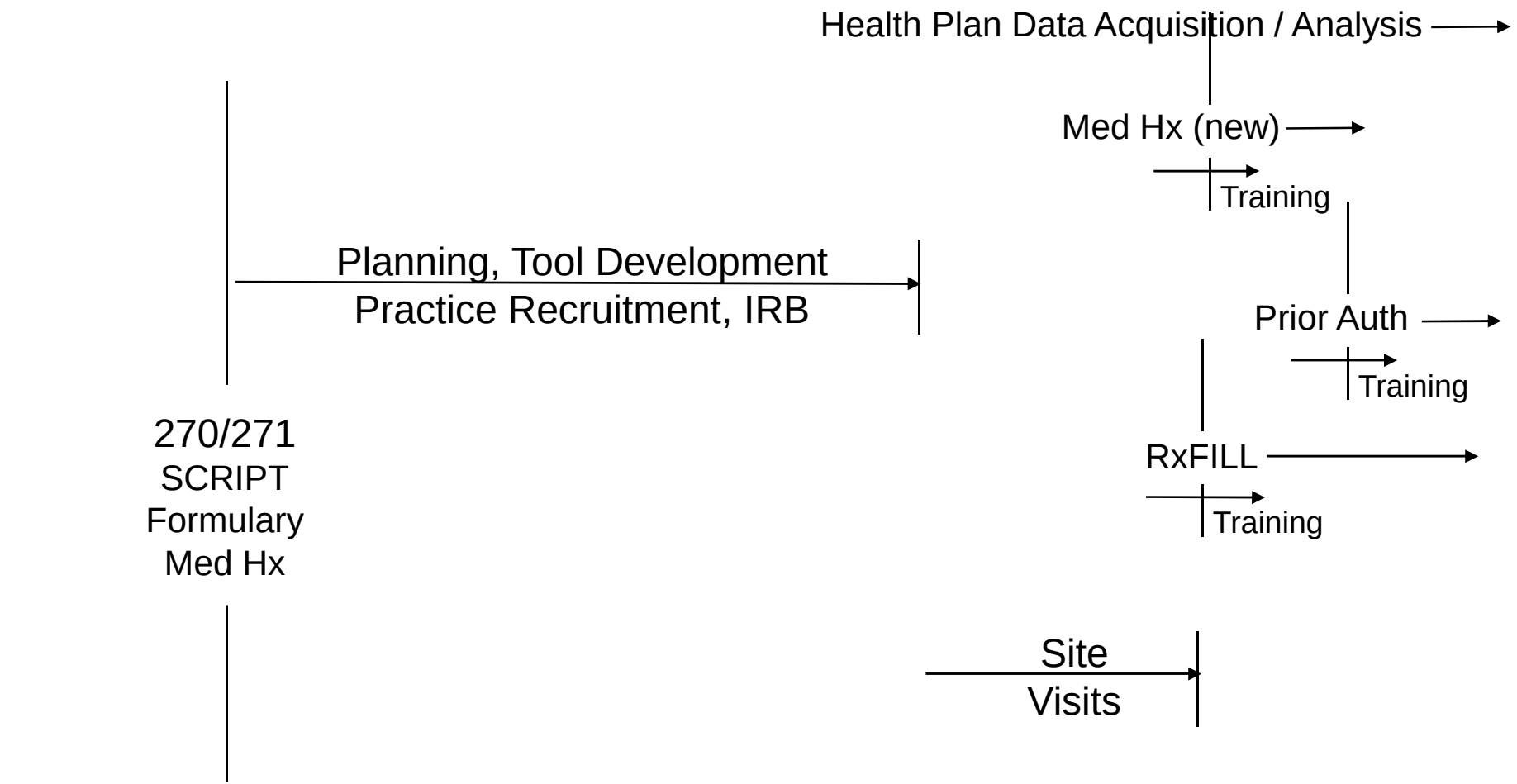
NEO eRx Project Participants

- UH Medical Practices + Ohio KePRO
- MGMA Center for Research
- Univ. of Minnesota Division of HSR
- InstantDx (OnCallData™)
- RxHub, SureScripts, NDC
- Aetna, Anthem, Medical Mutual of Ohio
- Partners Healthcare (Bates / Seger)

… and CMS, AHRQ, and the other pilots

NEO eRx: Workflow Overview

- eRx adoption and basic workflow
- Incumbent transaction volumes and workflow
  - –Eligibility, Medication Hx, NEWRX
- Transaction interventions
  - –Medication Hx, Fill Notification, Prior Auth



NEO eRX PROJECT TIMELINE 2006

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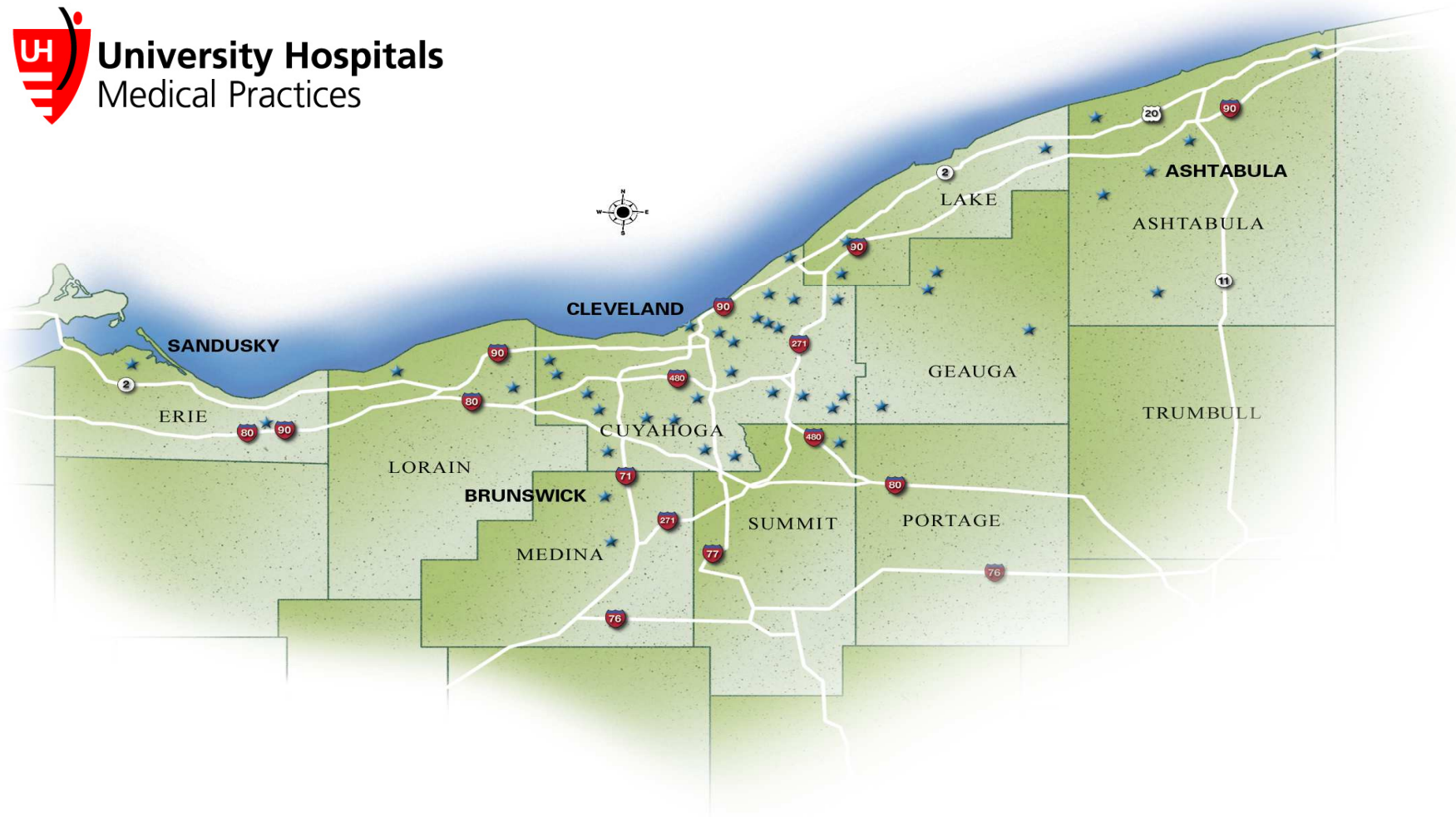
UH Medical Practices (UHMP)

University Hospitals
Medical Practices



285 physicians, 73 practices, 42 communities
46 primary care; 27 specialty
1.25 million office visits / yr

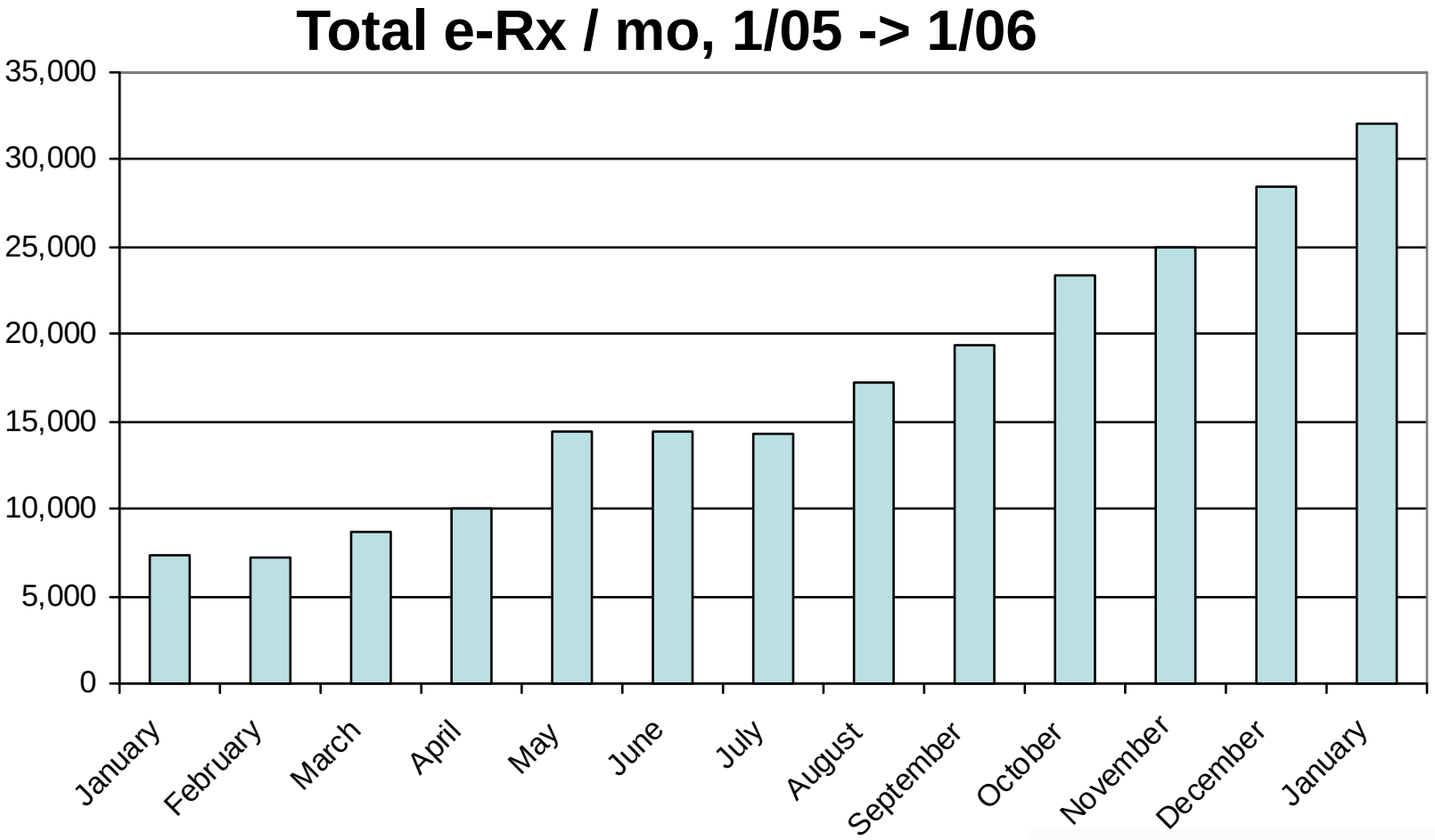
Small Practice Adoption: Magic Mix

You can lead a horse to water…

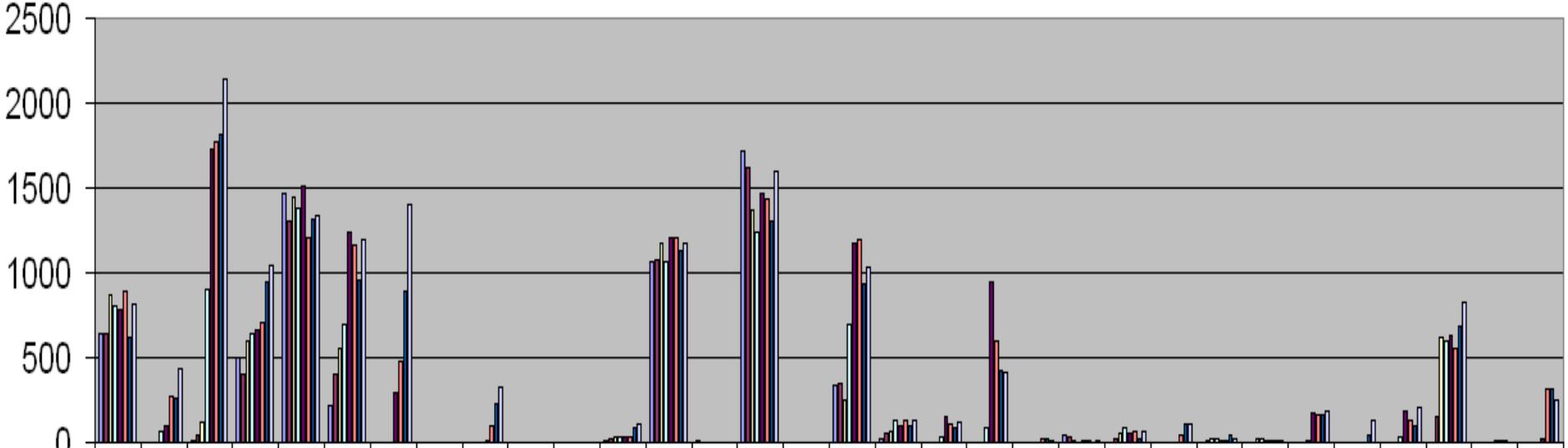
- eRx offered *free* to all UHMP practices
- Out-of-the-box integration w/ practice management system
- Minimal equipment requirements
- ASP delivery; robust remote training and support
- Each practice allowed to determine optimal workflow
- Malpractice subsidy if met threshold utilization criteria

Pre-Project eRx Adoption (All of UHMP)

AND make it drink (voluntarily) … !



Pre-Project eRx Adoption (by Practice)



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
January	639	0	12	503	1469	216	0	0	0	0	0	7	1062	12	1719	0	332	26	0	0	0	46	0	0	0	0	0	0	0	0	0	0
February	645	5	39	403	1303	407	0	0	0	0	0	21	1071	0	1618	0	352	58	0	0	0	30	18	0	6	3	0	0	1	147	0	0
March	865	5	116	603	1448	554	0	0	0	0	0	29	1173	0	1370	0	254	60	0	0	0	6	57	0	17	21	0	0	0	617	0	0
April	801	63	906	646	1379	697	0	0	0	0	0	33	1061	0	1240	0	699	130	31	92	0	4	84	0	23	24	11	0	30	599	0	0
May	788	101	1730	658	1515	1241	291	0	12	0	0	32	1210	0	1466	0	1173	103	152	946	2	8	51	0	10	16	169	0	184	635	9	17
June	890	270	1771	707	1204	1159	481	0	97	0	0	37	1211	0	1436	0	1192	129	110	602	27	6	64	46	14	9	161	0	131	553	6	318
July	618	262	1820	948	1314	956	896	0	227	0	0	91	1134	0	1306	0	936	97	87	422	20	5	27	108	39	6	166	42	99	687	8	311
August	811	434	2137	1042	1338	1199	1406	0	322	0	0	114	1178	0	1595	0	1030	130	117	412	9	13	69	108	22	16	187	129	211	823	5	246

eRx (Study) and Control Practices

Study (eRx) group (n=25 practices, 130 physicians)

- Part of University Hospital Medical Practices (UHMP)
  - Community-based, primary care practices in Northeast Ohio
- Access to OnCallData™ e-prescribing software
- At least one doctor in the practice generated a minimum of 150 eRx in any month of 2006 prior to enrollment

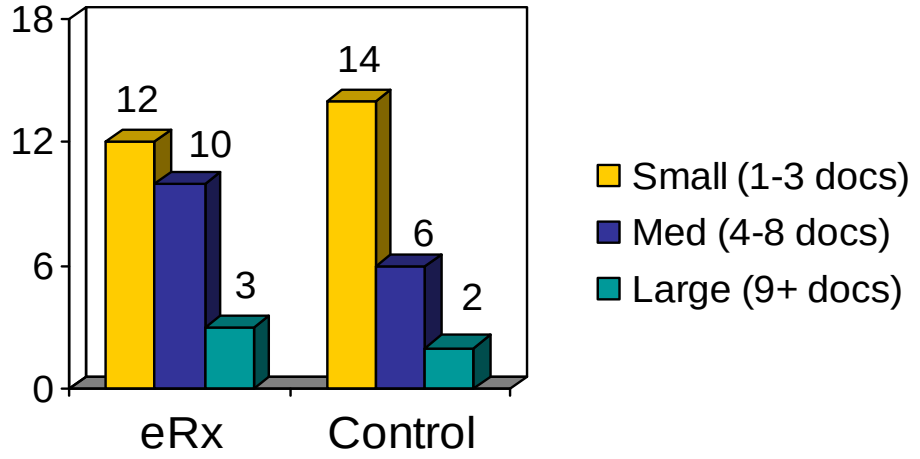
Control group (n=22 practices, 77 physicians)

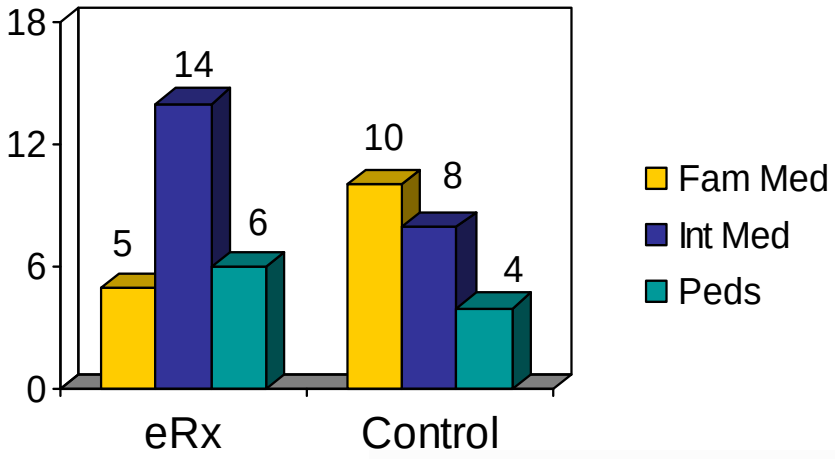
- Independent primary care practices in NEO
  - Not currently e-prescribing
- Convenience sample
  - Practices w/ Ohio KePRO relationship under 8th SOW

eRx and Control Practices

eRx and Control Groups:

- 25 UHMP practices with access to eRx (130 MDs)
- 22 non eRx practices (100 MDs)
- Loosely matched by size and specialty (separately)





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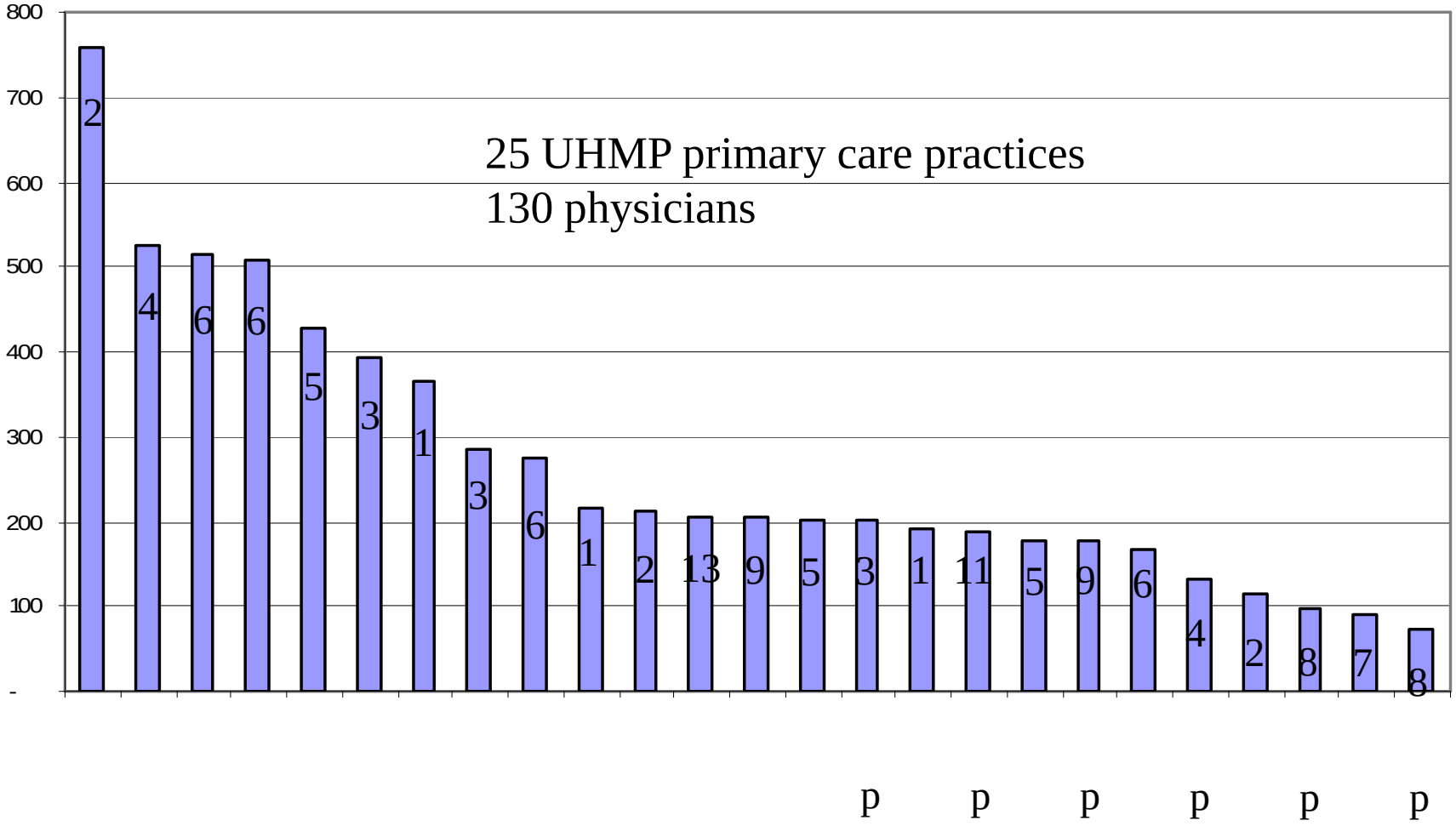
e-Prescribing @ 25 UHMP Practices

Month	Total eRx	Study Group	% of Total
January	32,153	21,095	65.6
February	31,723	21,304	67.2
March	40,079	26,549	66.2
April	35,680	23,406	65.6
May	42,646	27,497	64.5
June	40,451	26,588	65.7
July	37,795	24,349	64.4
August	43,560	27,977	64.2
September	42,228	27,660	65.5
October	47,998	31,402	65.4
November	46,440	30,343	65.3
December	44,674	29,131	65.2
TOTAL	**485,427**	**317,301**	**65.4**

eRx / prescriber / mo (10/06 by practice)

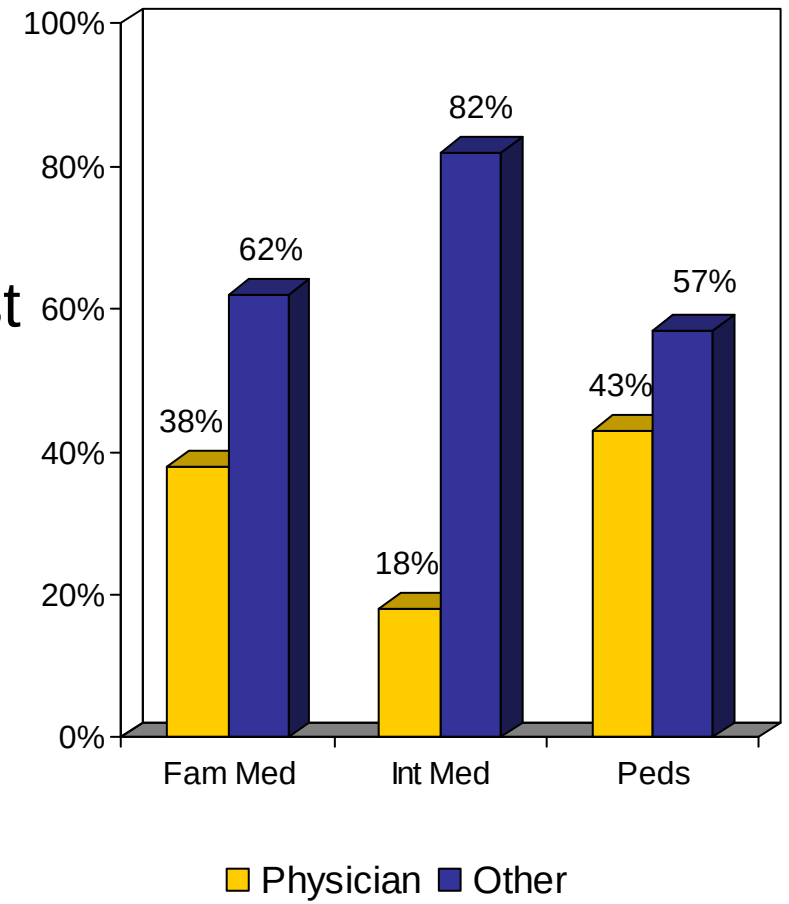


p = pediatric practice

at top of each bar = number of physicians in that practice

Surrogate-Based e-Prescribing

- 48,013 eRx in October (all UHMP)
  - 16,715 entered directly by MD
    - 15,724 NewRx (~1000 Renew)
  - 97 / 219 e-prescribers did at least some data entry themselves
    - 122 did none



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Renewal Workflow Findings

- eRx decreases dependence on phone / fax
  - Incoming Rx renewal requests from local pharmacies received by:

	eRx	Control
Phone	41%	62%
Fax	25%	36%
eRx	33%	0%

- eRx practices still depend on paper for internal processing
  - For phoned-in requests, 81% communicated to MD by paper
    - Only 7% entered into OnCallData™ on the *front* end
  - For faxed requests, fax itself used for internal communication 91%
- 73% sent back to pharmacy via eRx
  - only 33% come in by eRx, but most entered into OCD on *back* end
  - 25% of authorizations called or faxed to pharmacy vs. 90% in control

Characterizing Rx-Related Phone Calls

PHONE TALLY SHEET

Date: ☐☐ / ☐☐ / ☐☐

Day of Week (circle): M T W Th F

Page ☐ of ☐

Draft

NOTE: PLEASE START A NEW FORM FOR EACH DAY

For each call, place an "X" in the appropriate box for each set of questions

Key:

In = Incoming	Live = Person on phone	PT = Patient	Form = Formulary (incl. generics)	Yes = Chart requested / pulled to handle call
Out = Outgoing	VM = Voice Mail Message	Pharm = Pharmacy	PA = Prior Authorization	No = Chart not requested / pulled to handle call
		PBM = Pharm. Benefits Mgr.	Clarify = Clarify Prescriptions (e.g. legibility, other concern)	

	Call / Msg. Type	Caller Type (Incoming Only)	Time on Phone	Source/Destination	Rx Issue	Chart Request? (Incoming Only)
1	☐ In ☐ Out	☐ Live ☐ VM	☐ <2 min ☐ 2-5 min ☐ >5 min	☐ Pt ☐ Pharm ☐ PBM	☐ New ☐ Renew ☐ Form ☐ PA ☐ Clarify	☐ Yes ☐ No
2	☐ In ☐ Out	☐ Live ☐ VM	☐ <2 min ☐ 2-5 min ☐ >5 min	☐ Pt ☐ Pharm ☐ PBM	☐ New ☐ Renew ☐ Form ☐ PA ☐ Clarify	☐ Yes ☐ No

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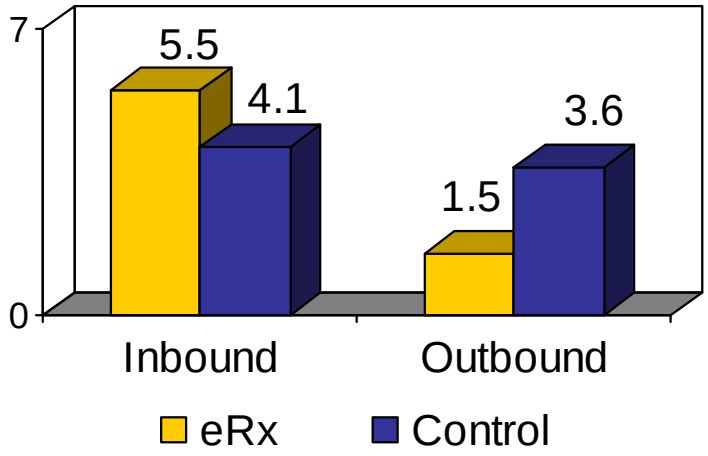
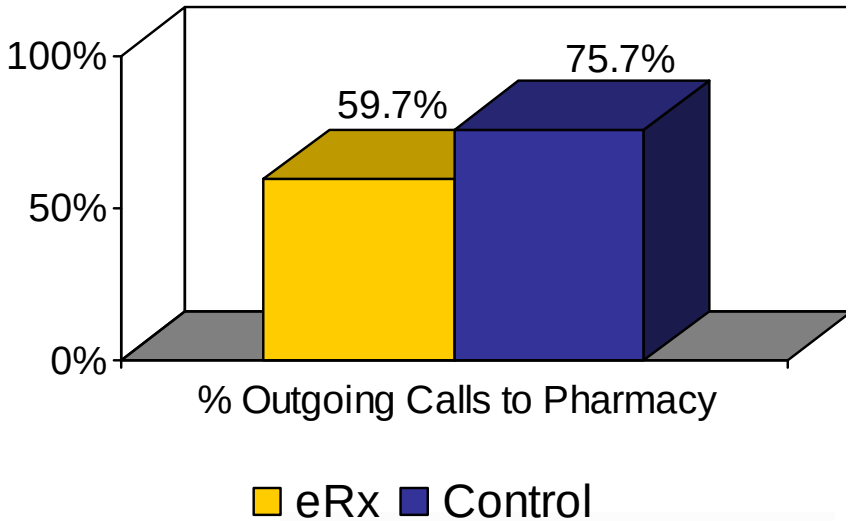
eRx Impact on Call Types

- Inbound / outbound Ratio



- Relative % of outbound calls going to pharmacy



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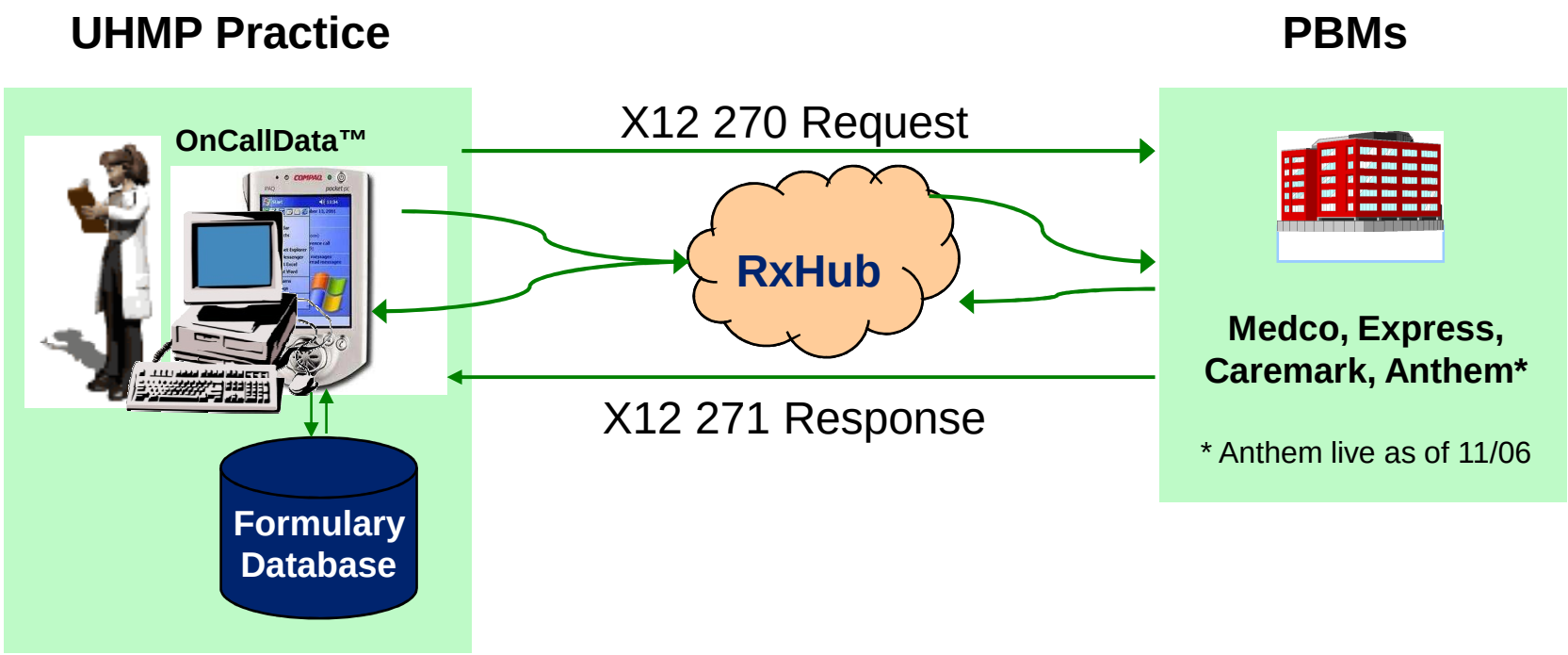
NEO eRx: Workflow Overview

- eRx adoption and basic workflow
- Incumbent transaction volumes and workflow
  - –Eligibility, Medication Hx, NEWRX
- Transaction interventions
  - –Medication Hx, Fill Notification, Prior Auth

Eligibility Checking Workflow

- Could be triggered manually, but…
- Usually automatic, on patient selection
- Formulary assignment behind the scenes (unless eligibility check failed, in which case formulary could be assigned manually)
- Users (and support team) uniformly unaware
- No dual-eligibility resolution workflow

Eligibility Checking Transaction



Jan → Dec '06: **176K + responses / 300K checks (~59% hit rate)**

Foundation Standard: Eligibility (X12 270/271)

OnCallData™ sends name, dob, zip, gender to RxHub, gets formulary identifier in return (informs formulary selection for that prescribing session)

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RxHub MPI Coverage in NEO (2006)

MSANAME	STATE	Population	Total_Lives	%
Canton-Massillon, OH MSA	OH	401,163	216,937	54.1%
Cincinnati-Hamilton, OH-KY-IN CMSA	OH	1,556,125	741,595	47.7%
Cleveland-Akron, OH CMSA	**OH**	**2,947,194**	**1,851,263**	**62.8%**
Columbus, OH MSA	OH	1,540,591	996,344	64.7%
Dayton-Springfield, OH MSA	OH	954,267	533,123	55.9%
Huntington-Ashland, WV-KY-OH MSA	OH	62,035	32,306	52.1%
Lima, OH MSA	OH	161,422	89,023	55.1%
Mansfield, OH MSA	OH	179,996	99,665	55.4%
Parkersburg-Marietta, WV-OH MSA	OH	64,513	32,709	50.7%
RURAL OHIO	OH	2,136,206	1,164,740	54.5%
Steubenville-Weirton, OH-WV MSA	OH	76,712	41,015	53.5%
Toledo, OH MSA	OH	614,641	432,023	70.3%
Wheeling, WV-OH MSA	OH	68,610	42,073	61.3%
Youngstown-Warren, OH MSA	OH	589,527	304,685	51.7%
	OH Total	11,353,002	6,577,501	57.9%

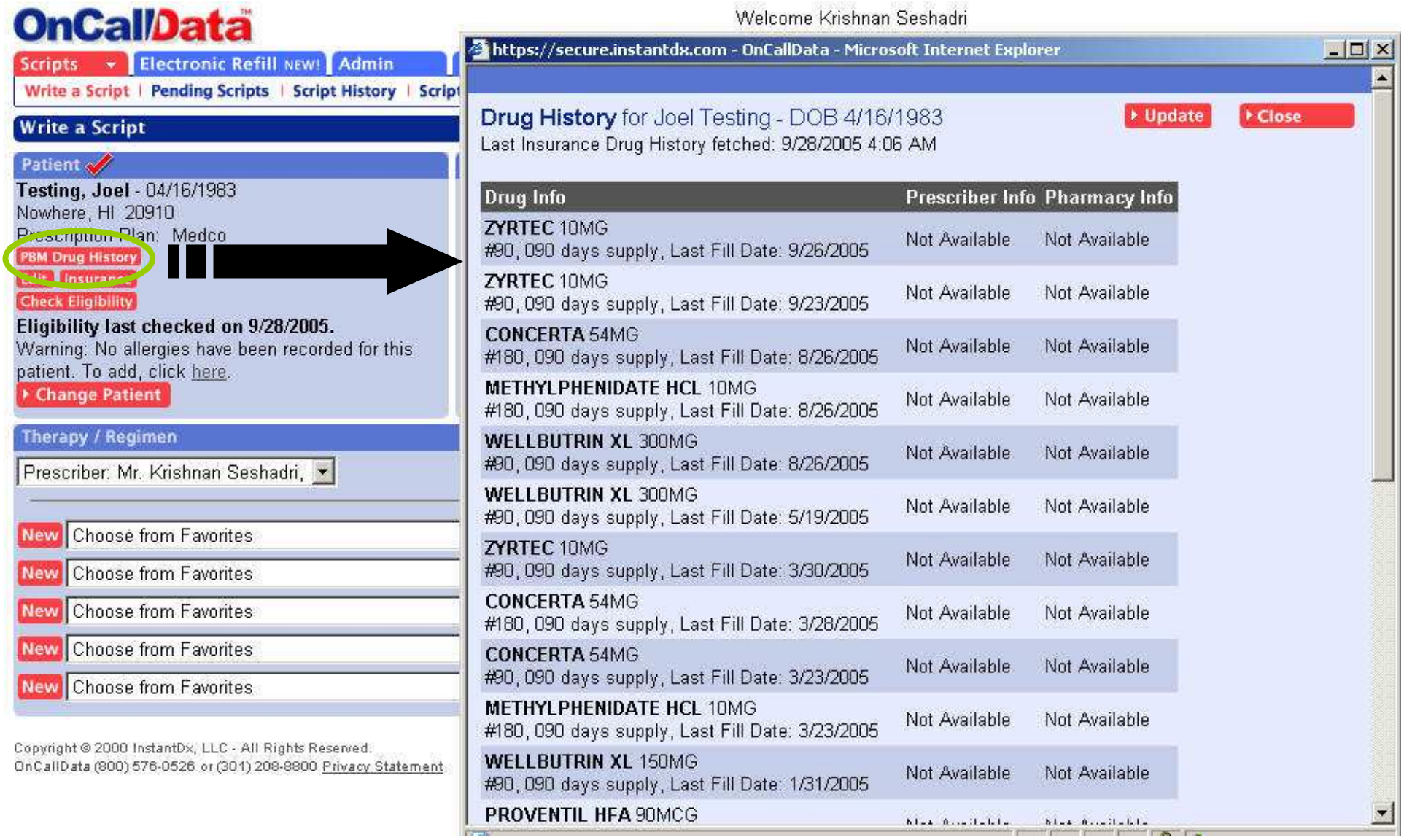
Eligibility Checking Transactions '06

	Eligibility Checks	Positive Responses	Percent Positive
January	11,500	7,291	63.4
February	19,354	11,877	61.4
March	25,514	15,727	61.6
April	23,361	14,356	61.5
May	27,457	16,371	59.6
June	25,475	14,966	58.7
July	24,035	14,094	58.6
August	27,250	15,909	58.4
September	26,347	14,625	55.5
October	30,498	16,531	54.2
November	29,746	16,347	55.0
December	29,320	17,521	59.8
TOTAL	**299,857**	**175,615**	**58.6**

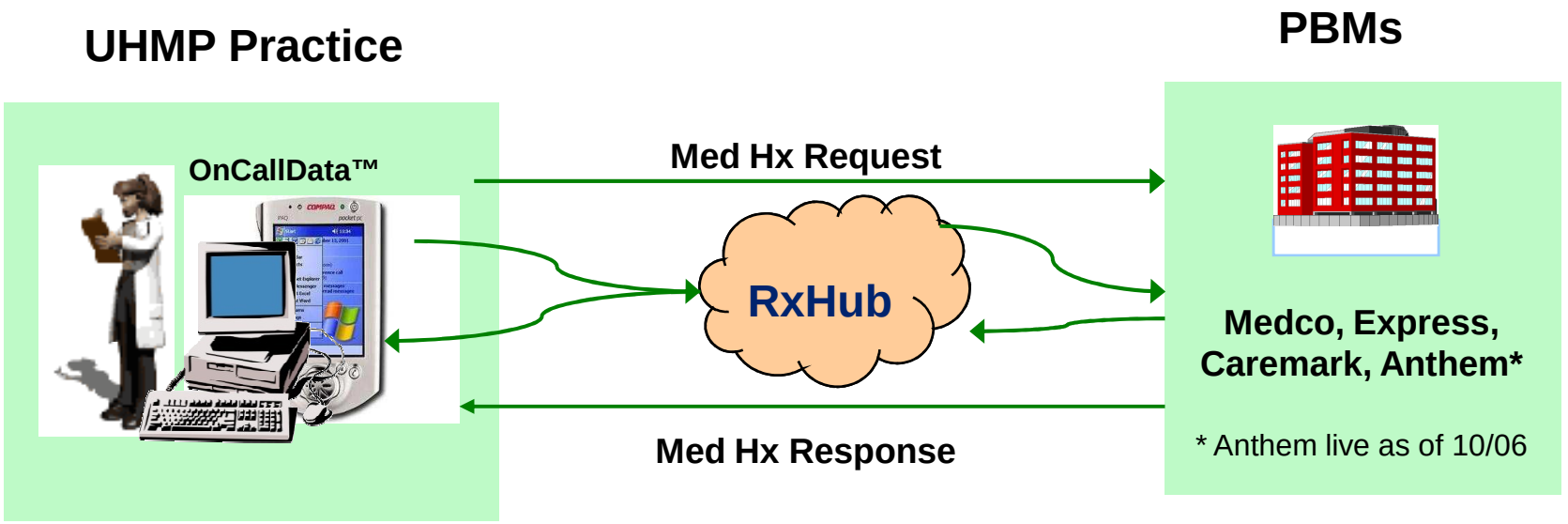
Medication History Transfer Workflow

- Automatically pre-fetched after positive eligibility check, but …
- User action (manual trigger) required to view
- Patient consent implied via clinic registration (intervening consenting prompt upon manual trigger largely ignored)
- Users (and support team) unfamiliar with function itself, much less more complex data source and interpretation issues
- Lack of dual-eligibility resolution workflow is a setup for false positive patient matching

Medication History Transfer Workflow



Medication History Transaction



June → Sept ’06: **46K med hx transfers (only 500 “views”)**

Initial Standard: Medication History (SCRIPT 8.1)
OnCallData™ requests med hx from RxHub, using info from prior eligibility check
(Shows interoperability between an Initial and a Foundation standard)

Medication History Actual "Views"

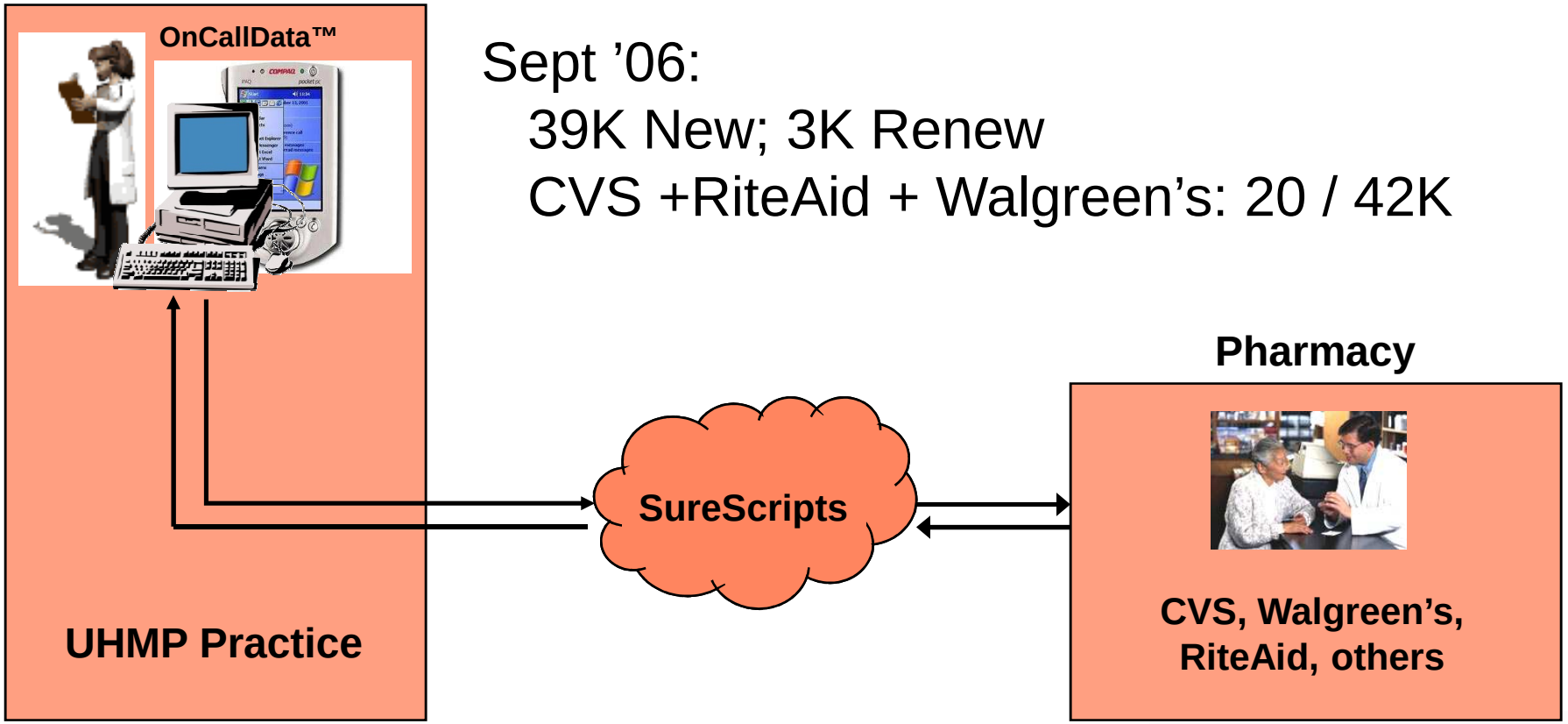
Year 2006	June	July	Aug	Sept
Medication History Transfers from RxHub	12324	10447	13063	9962
Medication History *Viewed*	117	122	134	129

Prescription Routing Transactions

Foundation Standard: NEWRX (SCRIPT 8.1)

New prescriptions (F_1) from OnCallData™ to pharmacy

Renewal request (F_2) from pharmacy; response (F_3) to pharmacy



* Mail order routing via RxHub not represented here

Prescription Routing Workflow

- Strong positive feelings by MAs
  - In spite of having to hand enter most new prescriptions and renewal authorizations before routing
- Large remaining opportunity for e-renewal requests
- Internal messaging for renewals mostly paper-based
- *Persistent* reliability problems related to pharmacy "receiving" electronically routed prescriptions
  - Primarily a retrieval / training problem at the pharmacy rather than true transaction failure, but didn't always ameliorate with time
  - Perceived increase in inbound calls from pharmacy b/o this

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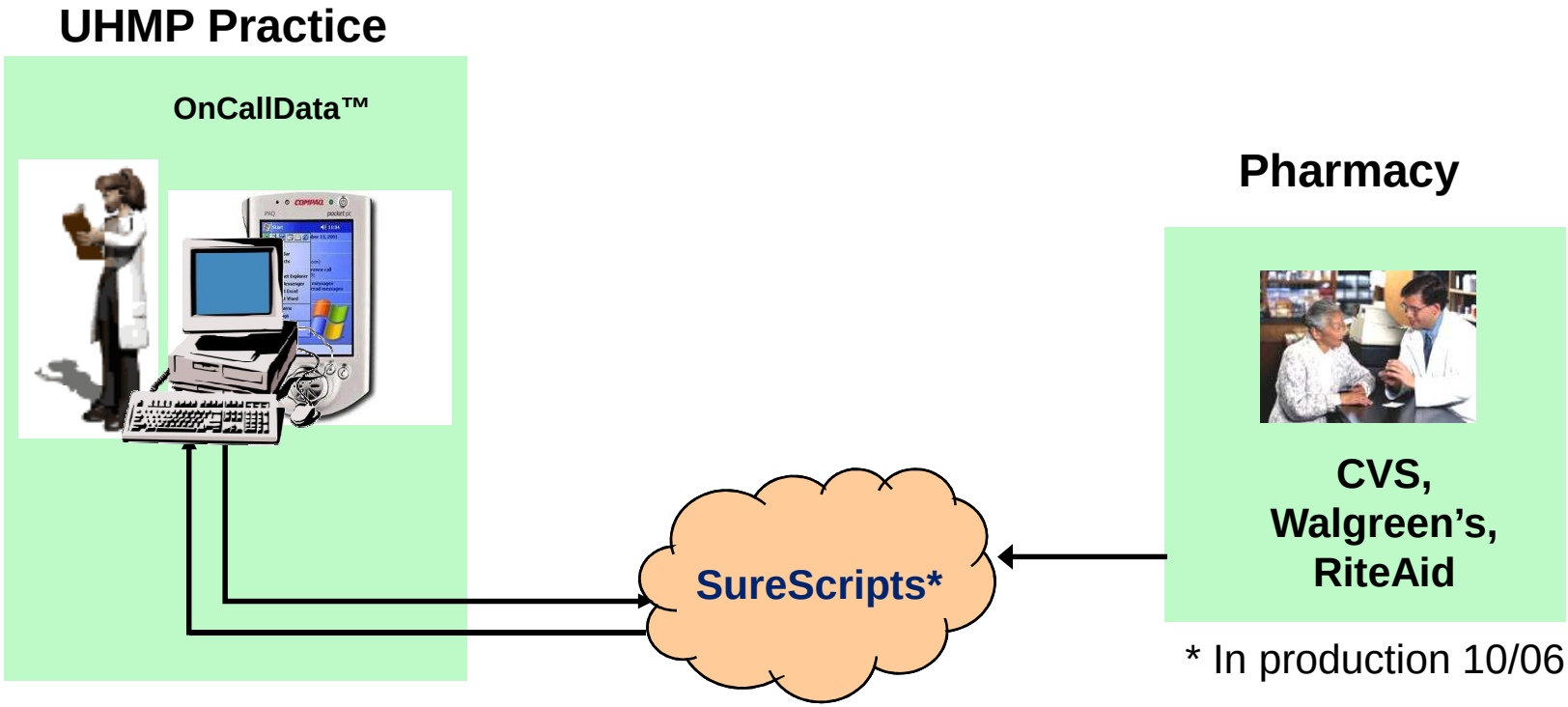
  - –Medication Hx, Fill Notification, Prior Auth

Medication History (SureScripts)



Initial Standard: Medication History (SCRIPT 8.1)

Pharmacy transfers prescription hx to SureScripts repository after dispensed

OnCallData™ requests med hx from SureScripts at encounter

(MPI but no eligibility check involved)

Medication History Test

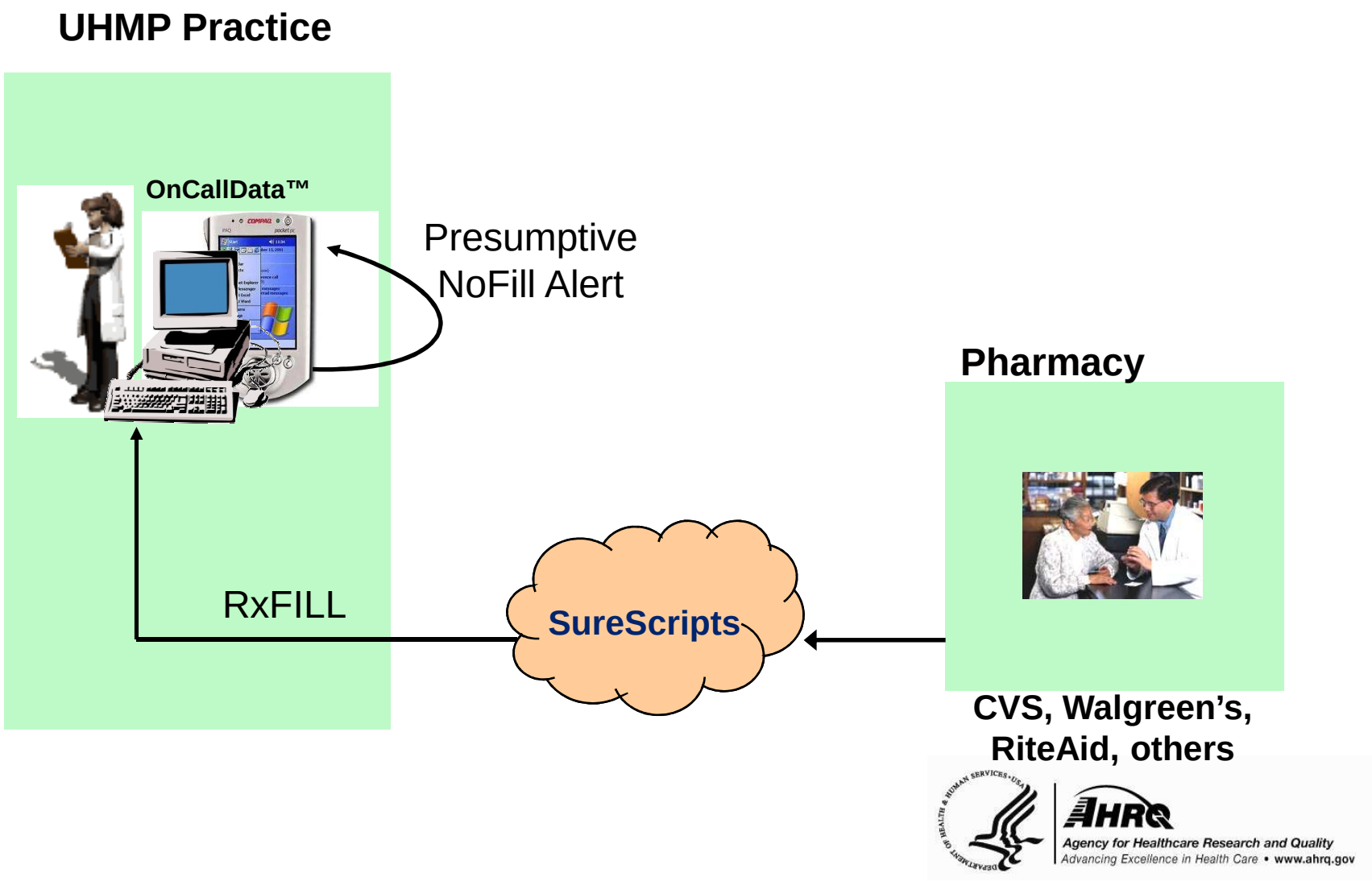
Medication history (November test)

- Existing (RxHub) rx history transfers not being looked at by users
  - Typical month: available 13,000 times but viewed only 130 (1%); jumped to 4% in October
- October ’06: SureScripts (filled prescriptions from pharmacies) added to RxHub (claims paid by prescription benefit managers)
- Training intervention at nine UHMP practices
  - Print prescription history and place on paper chart at time of encounter during November
- Only one practice complied, and was eager to stop
- Mixed response from physicians, but continue to support importance of transferred prescription history (at least conceptually)
- Early problems with SureScripts patient matching; unable to fully evaluate

Med History Transfers vs. Views

	Medication History Transfers	Medication History Views	Percent Viewed	% Change from Prior Month
June	12,324	117	0.95	
July	10,447	122	1.17	4.3
August	13,063	134	1.03	9.8
September	9,962	129	1.29	-3.7
October	12,464	488	3.92	278.3
November	11,807	579	4.90	18.6
December	13,295	184	1.38	-68.2
TOTAL	83,362	1,753	2.10	

RxFILL / NoFILL

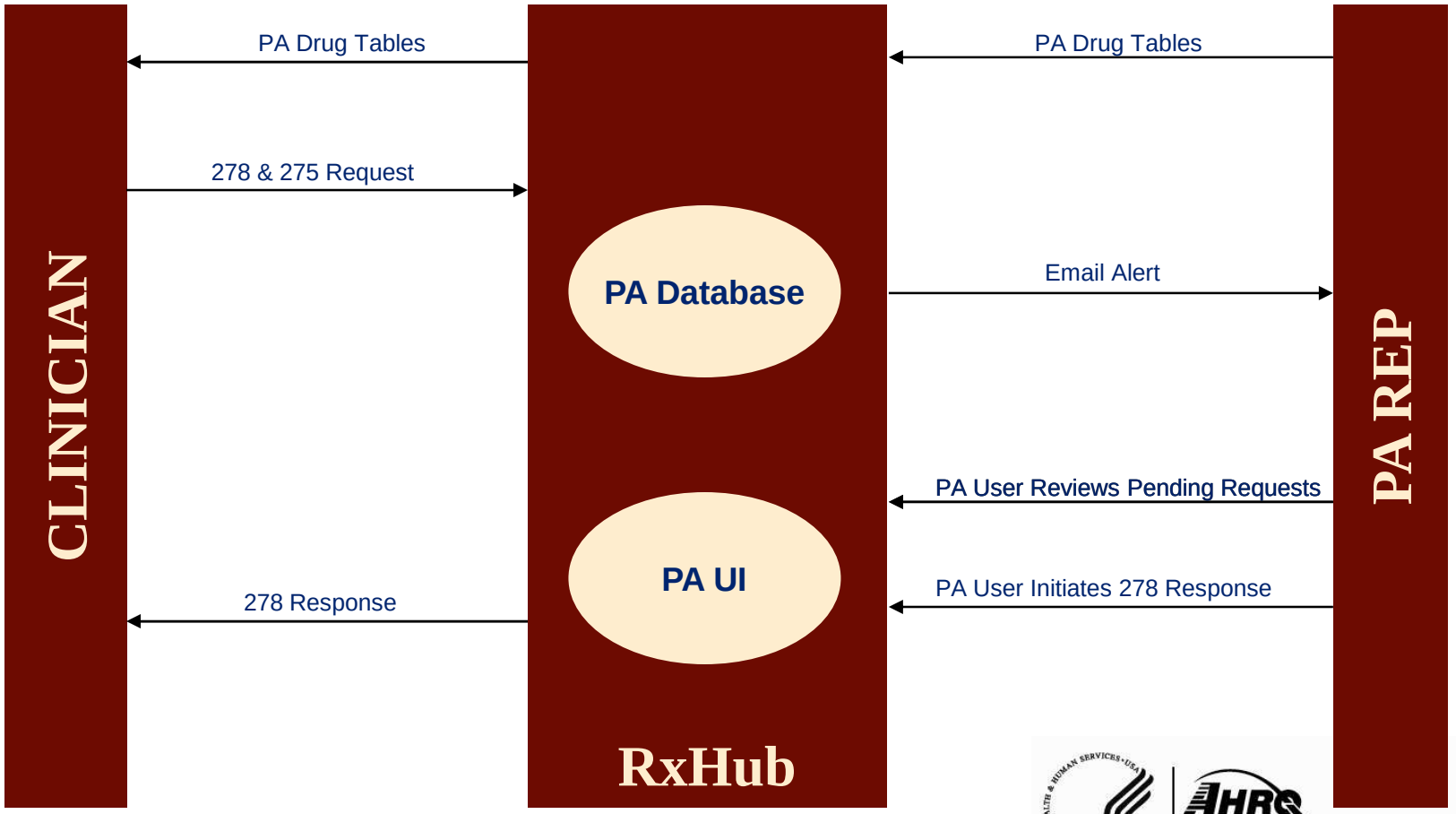


RxFill / NoFILL Testing

- *Presumed* NoFill alert (no actual transaction)
- Go-live 10/23; aborted ~10/28 (NDCs missing)
  - Intense workflow (and legal) planning, training
- Go-live 10/31; aborted 11/29 (RxFILL mix-up)
  - Reared head w/ flood of false NoFill alerts
- Reactivated 12/1 – but not “salvageable” at that point
  - Most of 9 practices not paying much attention
- RxFill lacks interop w/ NewRx
  - No tracking number for closing the loop

ePrior Auth (X12 278 + 275)

Production test with Anthem 12/06



Prior Authorization Testing

- Prior Authorization test with Anthem; “unsolicited model”
  - Prescriber sees drug-specific questions when drug is picked
    - Celebrex, Mobic, Lyrica, Provigil, Viagra, Nexium, Crestor, Vytorin
  - Answer questions, submit and receive response via OnCallData™
    - *PLUS* parallel fax-based workflow
- All UHMP non-pediatric practices, no training!
- Live 12/10/06
- 30 transactions over 4 weeks
  - 17 prescribers, 13 practices (25/30 by surrogates)
- Mean turnaround time for authorizations: 87 min
  - Highly valued
- Main glitch: 12/30 were “repeats”

Summary: Adoption and Workflow

- eRx w/ advanced transactional capabilities *can* be rapidly adopted by small, community-based practices
  - PMS integration, no license fee + small incentive
  - Large (>2/3) dependence on surrogates
    - Implications for decision support and safety benefits unclear
    - Policy guidance? P4P?
  - Big impact on efficiency and communication channels, but…
    - Paper-based internal communication still predominates
    - Faxing is tough to beat re: overall resource requirements
    - Opportunity for additional efficiency with more pharmacy participation plus true e-messaging *within* the practices
  - Conventional wisdom challenged:
    - eRenewals drive adoption (?)
    - Surrogates provide bridge to MD adoption (?)
    - eRx is a stepping stone to a full EMR (?)

Summary: Standards

- Eligibility checking works remarkably well
  - But users universally unaware
  - No human assessment of dual-eligibles or possible false+ MPI matches
  - Disappointing impact on formulary/cost but difficult to interpret
- NEWRX workhorse – extremely important
  - Primary driver of *surrogate* adoption
  - Persistent transmission reliability issues
    - Most problems due to human factors @ pharmacy?
- Med Hx: Transaction is easy; workflow integration isn't
- NoFill clinically risky w/o true transaction; need order ID
- Prior Auth: not fully tested; big hit for providers