Electronic Prescribing

A Pathway to Advanced HIT?

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What Is "Electronic Prescribing?"

- **Providers' use of computer systems to generate or renew prescriptions**
  - **A type of computerized physician order-entry (CPOE)**
  - **May be part of an electronic health record (EHR) vs. stand-alone e-prescribing system**

- **"e-prescribing" is a synonym**
  - **doesn't necessarily imply online (internet) systems**

E-Rx: A Focus for Transformation

- **Safety: Medication errors are prevalent**

- **Costs: Pharmaceuticals a growing component of health care costs**

- **Office efficiency**
  - **Rx management inefficient for most MD offices**
  - **e-Rx may be easier to implement than full EHR**
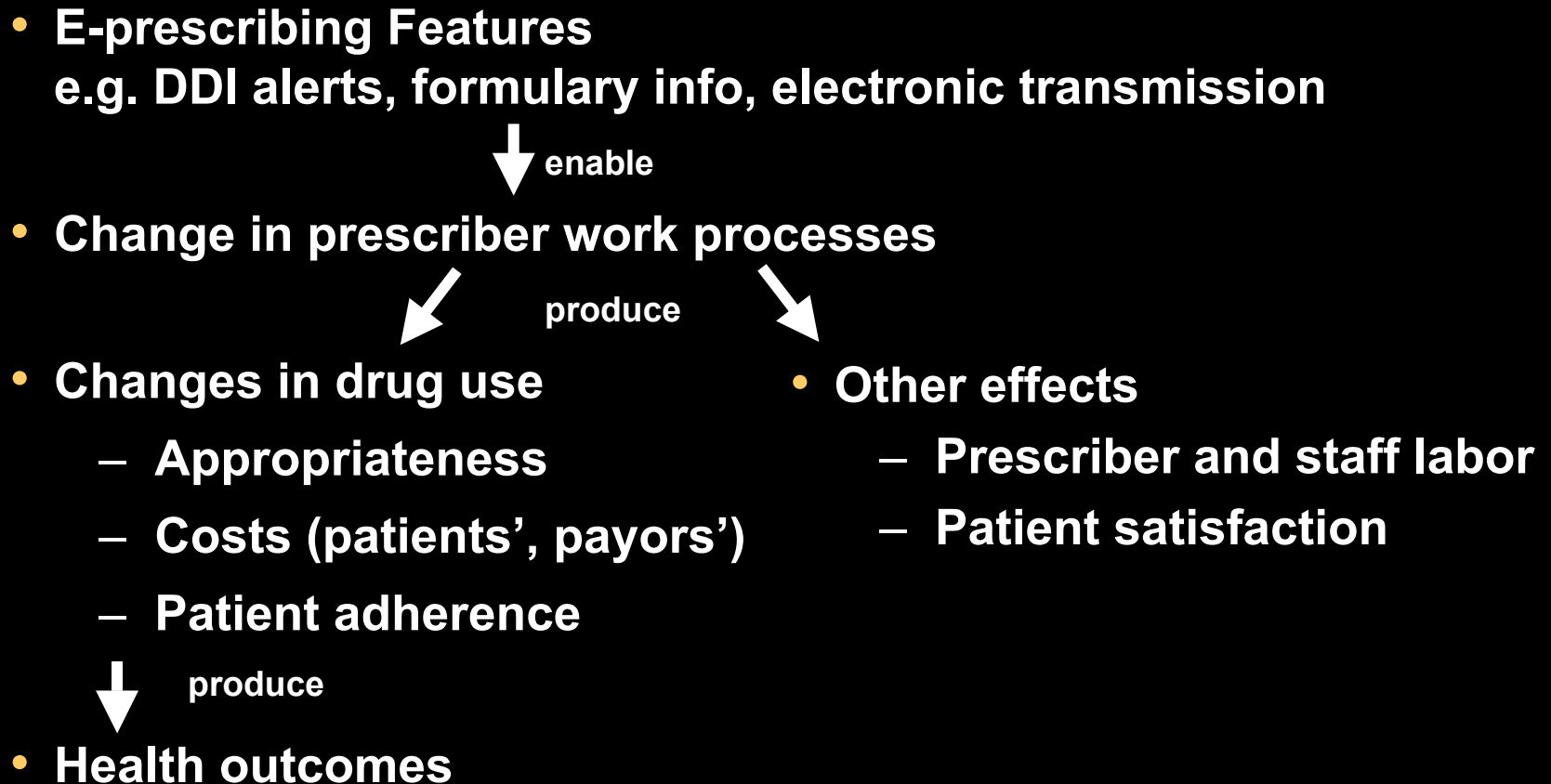 - **A step toward EHRs**

Risks of Harm from Outpatient Prescribing

Study	Study Population	*Preventable* adverse drug event rate	Serious, Life Threatening, or Fatal ADE rate
Honigman, 2001	15,665 patients (EMR review)	2.0 per 100 patients per year	0.4 per 100 patients per year
Gurwitz, 2003	27,617 Medicare patients (record review)	1.4 per 100 person-years	0.8 per 100 patients per year
Gandhi, 2003	661 outpatients (patient report)	3.0 per 100 patients	0.3 per 100 patients

Talk Overview

- **Design theory: How does it work?**

- **Review RAND's expert consensus recommendations for e-prescribing**
    - **Variance in implementation among systems**

- **MMA-mandated pilot studies**
    - **Testing 6 "initial" standards that support advanced e-prescribing features**

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Design Theory

- **E-prescribing Features
e.g. DDI alerts, formulary info, electronic transmission**

  ↓ **enable**

- **Change in prescriber work processes**

  ↙ **produce** ↘

- **Changes in drug use**

    – **Appropriateness**

    – **Costs (patients', payors')**

    – **Patient adherence**

  ↓ **produce**

- **Health outcomes**

- **Other effects**

    – **Prescriber and staff labor**

    – **Patient satisfaction**

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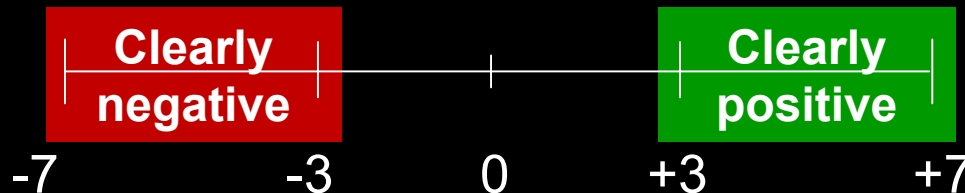
Stakeholders Have Different Goals for eRx

- **Medical Groups**
  - **Workflow, risk management**

- **Payers & PBMs**
  - **Expenditures, formulary adherence**

- **Patients**
  - **Health outcomes, out-of-pocket costs**

- **Pharmaceutical manufacturers**
  - **Getting medications to market efficiently**

RAND eRx Recommendations Study

- **Recommend e-prescribing features that promote patients' interests without hindering e-prescribing adoption or violating patient privacy**

- **Methods**

  - **Delphi expert panel process**
    $\rightarrow$ **60 recommendations**

  - **Site visits to clinics with e-prescribing**
    $\rightarrow$ **assessment of current systems**

Delphi Expert Panel Process

- **11 Panelists, chair: Don Berwick**

- **Rated recommendations for effect on:**
    - **Patient safety and health outcomes**
    - **Helping patients manage their costs**
    - **Maintaining patient privacy**
    - **Promoting clinician acceptance**

- **Rating scale:**

Clearly negative		Clearly positive
-7	-3	0	+3	+7

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Sample Median Ratings

|	Safety/ Health	Patients' Costs	Patient Privacy	Clinician Acceptance
7. Prescribers with care responsibility for the patient should be able to review the patient's complete current medication list, based on open prescriptions from all other clinicians.	7	3	-2	6
21. The system should enable providers to determine the accurate formulary status and the actual cost to the patient for each medication option based on the patient's prescription insurance coverage.	2	7	0	3

Rating Results

- **All 60 recommendations had median ratings in the "clearly positive" range on at least 1 dimension**

- **26 recommendations had a median rating of 6 or greater on at least 1 dimension**

- **No medians were in the "significantly negative" range on any dimension**

- **Only one was significantly controversial**

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Median Ratings of the 60 Recommendations

Patient Safety and Health Outcomes

- **52 rated in the "clearly positive" range**
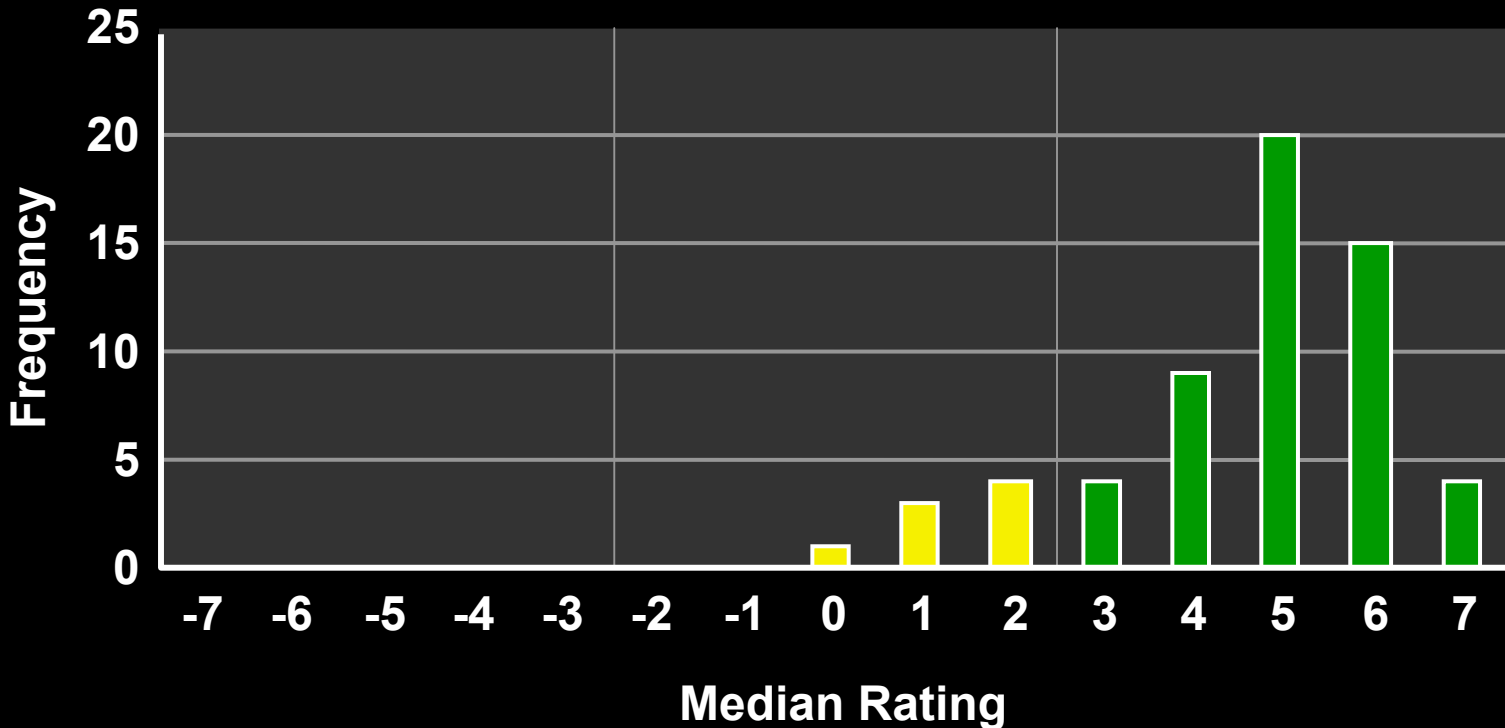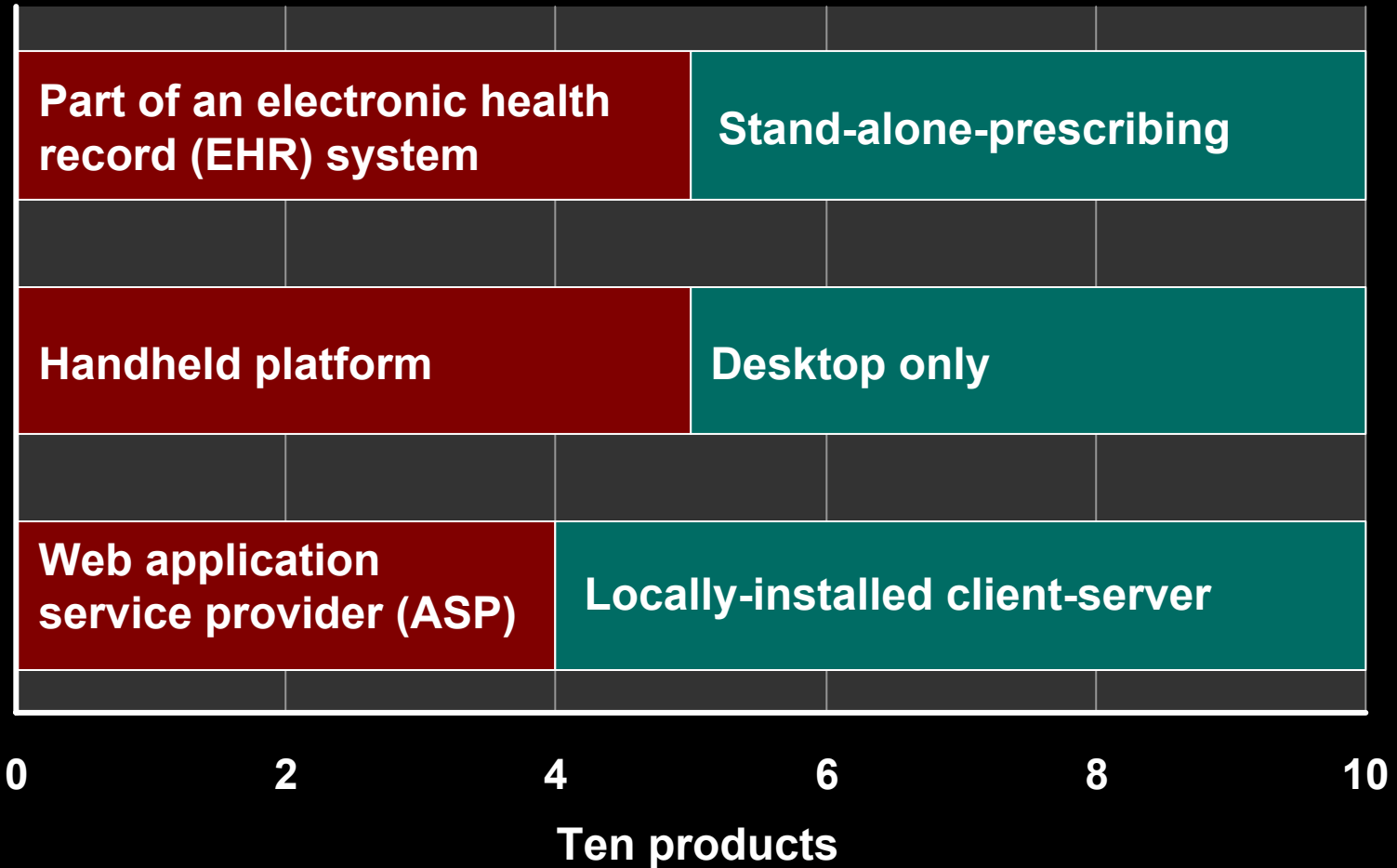
Field Study: Methods

129 Companies Screened

$\downarrow$

58 e-Rx products chosen (from 51 companies)

$\downarrow$

29 products (from 26 companies) met inclusion criteria: outpatient, "significant" adoption
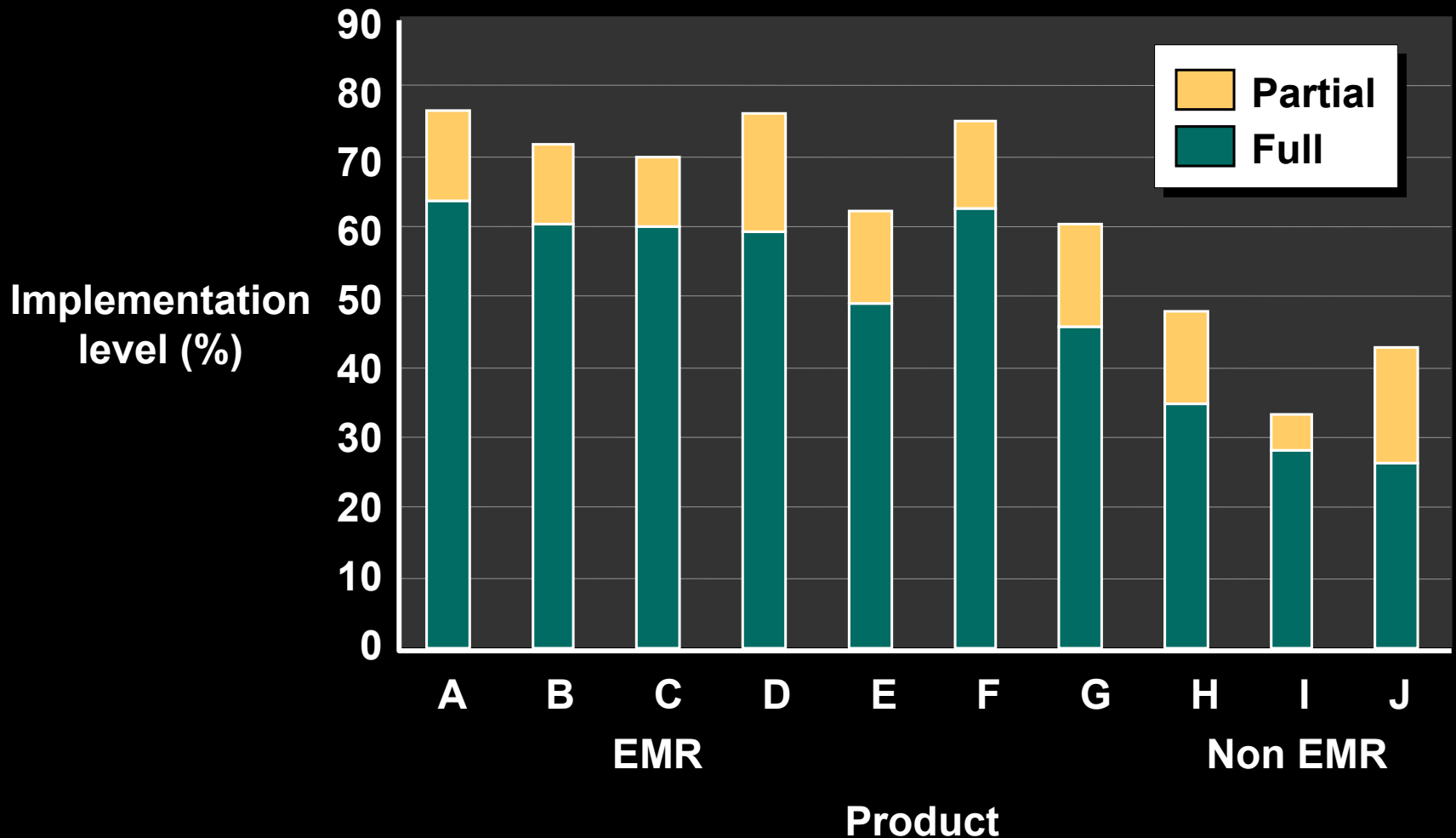
$\downarrow$

10 representative product sites selected

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Final Field Study Sample

Category		
Part of an electronic health record (EHR) system	Stand-alone-prescribing	
Handheld platform	Desktop only	
Web application service provider (ASP)	Locally-installed client-server	

Ten products (0, 2, 4, 6, 8, 10)

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On Average, 50% Were Implemented

Implementation by Product

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Vendors' Claims

- **Interviews of 5 vendors asked about implementation of each recommendation**

Vendor	Actual Implementation	
Claim	**Full or Partial**	**None**
Full or partial:	149	40
None:	8	103

- **Sensitivity: 96%, Specificity: 72%**

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Conclusions

- **Commercially available eRx systems don't consistently implement important features**
  - **Decide what features most important for your setting**
  - **Can't rely entirely on vendor claims**
  - **Caveat emptor**

- **Certification should help**

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Certification — CCHIT

- **Commission for Health Information Technology**
  - **Started from HL7's EHR-S "Draft Standard for Trial Use"**
  - **Commission set priority (L, M, H) and feasibility (2005, 2006, 2007) for each individual criterion**
    - **e.g. F18: "The system shall support medication lists."**
  - **Certification processes now up and running**
    - **First list of certified products expected in July, 2006**

MMA Goal for E-Prescribing

- **Deliver *information* to the point of care that enables more *informed decisions* about *appropriate* and *cost effective* medications.**

HHS's "Foundation" Standards

- **NCPDP SCRIPT**
    - **New prescription**
    - **Renewal**
    - **Change**
    - **Cancel**

- **ANSI ASC X12 270/271 Eligibility inquiry from MDs**

- **NCPDP Telecomm Eligibility inquiry from pharmacies**

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Initial Standards

- **NCPDP Formulary and Benefit standard**

- **NCPDP SCRIPT Medication History function**

- **NCPDP SCRIPT Fill Status function**

- **X12N 278 and 275 for Prior Authorization**

- **NLM's RxNorm drug nomenclature**

- **NCPDP Structured and Codified Sig standard**

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Conceptual Model

- **Structure of the standard**

  ↓ **enables**

- **Information display or capture at POC (eRx feature)**

  ↓ **enables**

- **Changes in work processes**

  ↓ **produce**   ↓

- **Changes in drug use**

  – **Generics, formulary**

  – **Mis-, under-, over-**

  ↓ **produce**

- **Other effects**

  – **Office labor and other costs**

- **Health Outcomes**

  – **Health service use**

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RAND - New Jersey MMA Pilot Study

- **New Jersey E-prescribing Action Coalition**

  - **Health plan/Payers**
    - **Horizon BCBSNJ**
    - **Caremark Rx**
  - **e-prescribing vendors**
    - **iScribe**
    - **Allscripts**
    - **InstantDx**

  - **Intermediaries**
    - **RxHub**
    - **SureScripts**
  - **Evaluation**
    - **RAND**
    - **Point of Care Partners**
    - **UMDNJ**

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Methods Overview

- **All standards:**
  - **Workflow modeling**
  - **Technical expert panel**

- **For Med Hx, F & B:**
  - **Prescriber site visits before & after eRx**
  - **Pharmacy site visits**
  - **Claims data analysis before & after eRx**
  - **Prescriber survey**

- **For Prior authorization:**
  - **Prescriber use of a working prototype**

- **For Fill status:**
  - **Focus group evaluation of storyboard prototypes**

- **For RxNorm, Sig:**
  - **Lab evaluation**

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Workflow process modeling
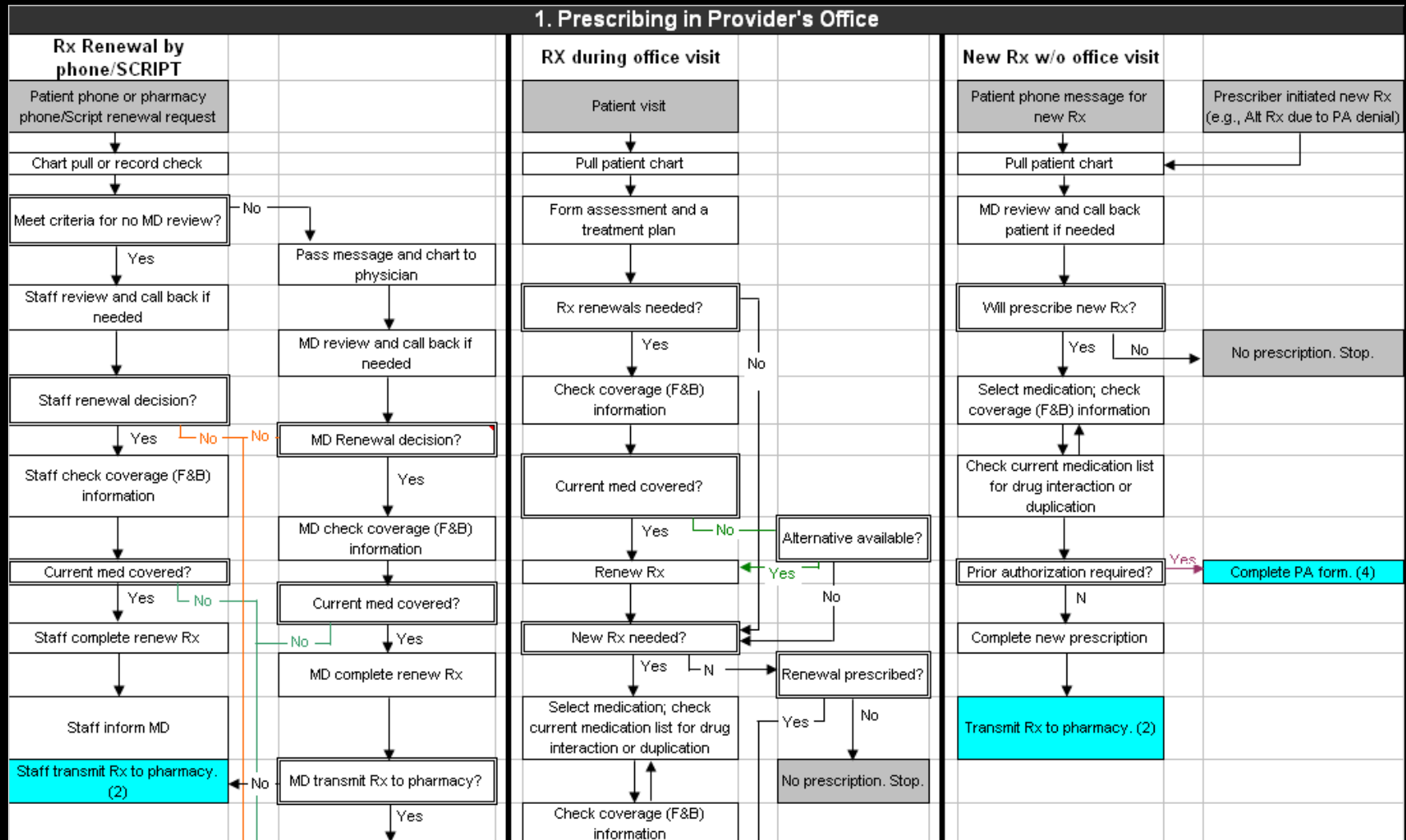
Technical Expert Panel

Category		Company	Primary Contact
Point of care software vendors	EHR	**Allscripts**	Jill Helm
	eRx	**iScribe**	Linda Schilling
	eRx	**InstantDx**	Krishnan Seshadri
	EHR	MedPlus	Rohit Nayak
	eRx	ZixCorp	David Robertson
Content Providers		First DataBank	Tom Bizzaro, RPh
		Wolters Kluwer	Karen Eckert, RPh
Intermediaries		**RxHub**	Teri Byrne
		SureScripts	Ken Whittemore, RPh
		NDC	Warren Williams
Pharmacies	Mail	**Caremark Mail**	Jane Niemtschk
	Mail	Medco Mail	Michele Glynn
	Large Chain	**Walgreens**	Mike Simko, RPh
	Independent	QS1	Tammy Devine

Prescriber office site visits

- **Participants**
  - **6 iScribe, 6 AllScripts offices**
  - **2 pharmacies**

- **Data**
  - **Qualitative interviews with**
    - **Physicians/prescribers**
    - **Office staff, Nurses**
  - **Activity logs**
    - **Telephone call-handling**
  - **Direct observation**
    - **Physician activities**

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Prescriber survey

- **Measure prescribers' perceptions of how much the information provided by**
  - **formulary & benefit**
  - **medication history**
  - **is enabling**
    - *informed decisions* **about** *appropriate* **and** *cost effective* **medications**
    - **office efficiency**

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Secondary data (before vs. after e-Rx)

- **Errors of commission (DDIs, Harmful meds)**

- **Adverse outcomes**
  - **ED visits for med-sensitive conditions (CHF, HTN crisis, Asthma)**
  - **Hospital admissions**

- **Formulary adherence**

- **Refill Adherence**

Prior Authorization

- **Can we represent Horizon's PA forms using the 275-HL7 PA attachment specification?**

- **Build prototype module for conducting ePA**
  - **iScribe and Allscripts**
  - **RxHub and Caremark**

- **Assess:**
  - **Perception of work changes for physician, staff**
  - **Prescribers' use**
  - **Changes in propensity to use PA meds**

RxNorm

- **MediSpan First Databank**

- **10,000 new Rxs, 10,000 renewals**
  - **Translate to SCD and SBD codes**
  - **Completeness, accuracy**

Fill Status transaction of SCRIPT

- **Not in use today**
  - **High potential volume, Demand uncertain**

- **RAND / EPAC evaluation plan**
  - **"Storyboard" prototypes**
    - **Fill Status vs. Med Hx for presenting adherence**
  - **Focus groups**
    - **Potential acceptance**
      - **Excess work**
      - **Liability**
      - **Patient privacy**

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Structured and Codified Sig

- **2000 new Rxs with text instructions**
  - **Automated and manual processing to represent instructions in standard**

- **Which elements of *Sig* are needed?**

- **What kinds of prescriptions (if any) can't be represent text using *Sig***

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Other MMA Pilots

- **SureScripts – Brown**
  - **6 POC vendors, 10 pharmacies; Surveys**

- **MA Share**
  - **Adding eRx to an EHR; ADEs**

- **Achieve Technologies**
  - **Adding eRx to a long-term care EHR**

- **Ohio KePRO**
 - **1 POC system in distributed provider network**

What's Next?

- **April, 2007: MMA Pilots' report to Congress**

- **2007: Grants for e-prescribing implementation**

- **April, 2008: Final e-prescribing standards due**

- **Market forces**
  - **Payer sponsorship?**
  - **Physician demand?**
  - **Patient demand?**

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Median Ratings of the 60 Recommendations

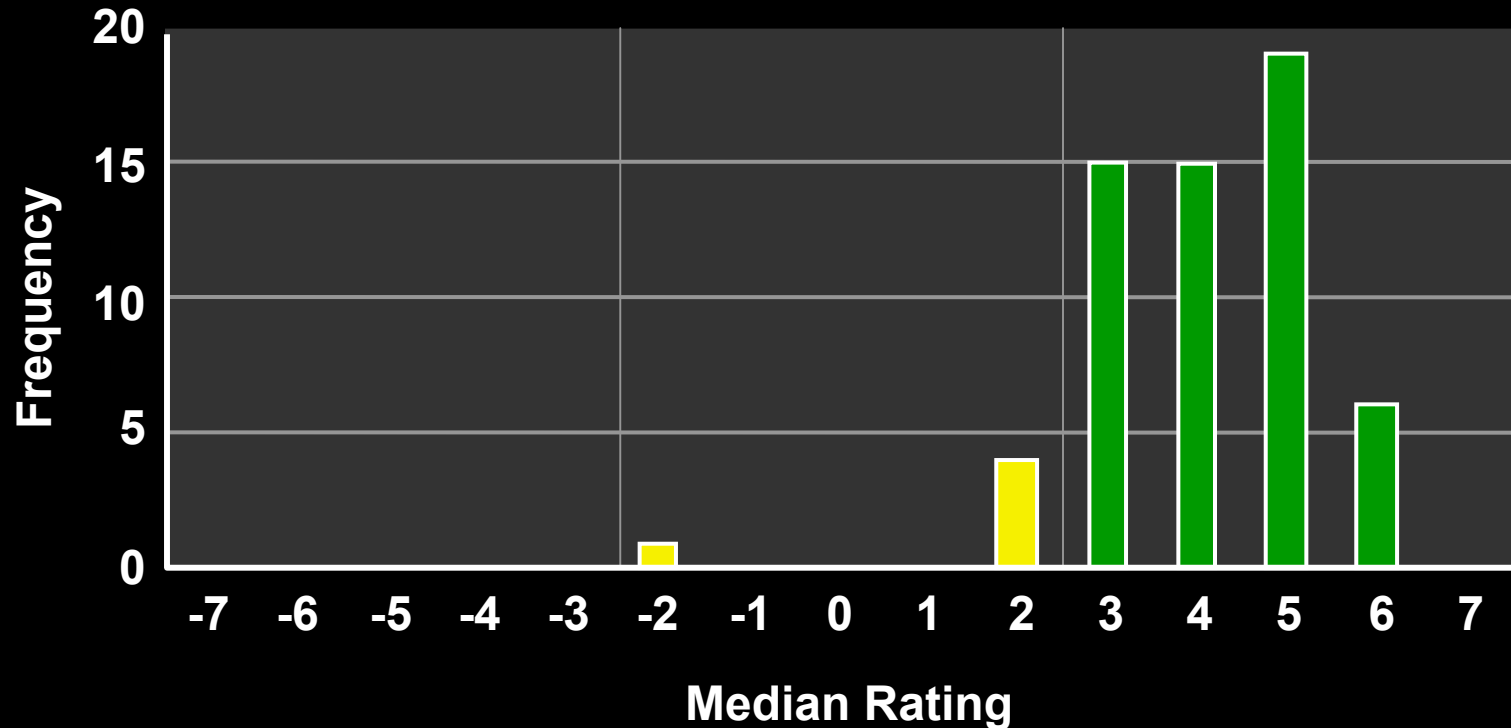## Helping Patients Manage Their Costs

- **18 rated in the "clearly positive" range**
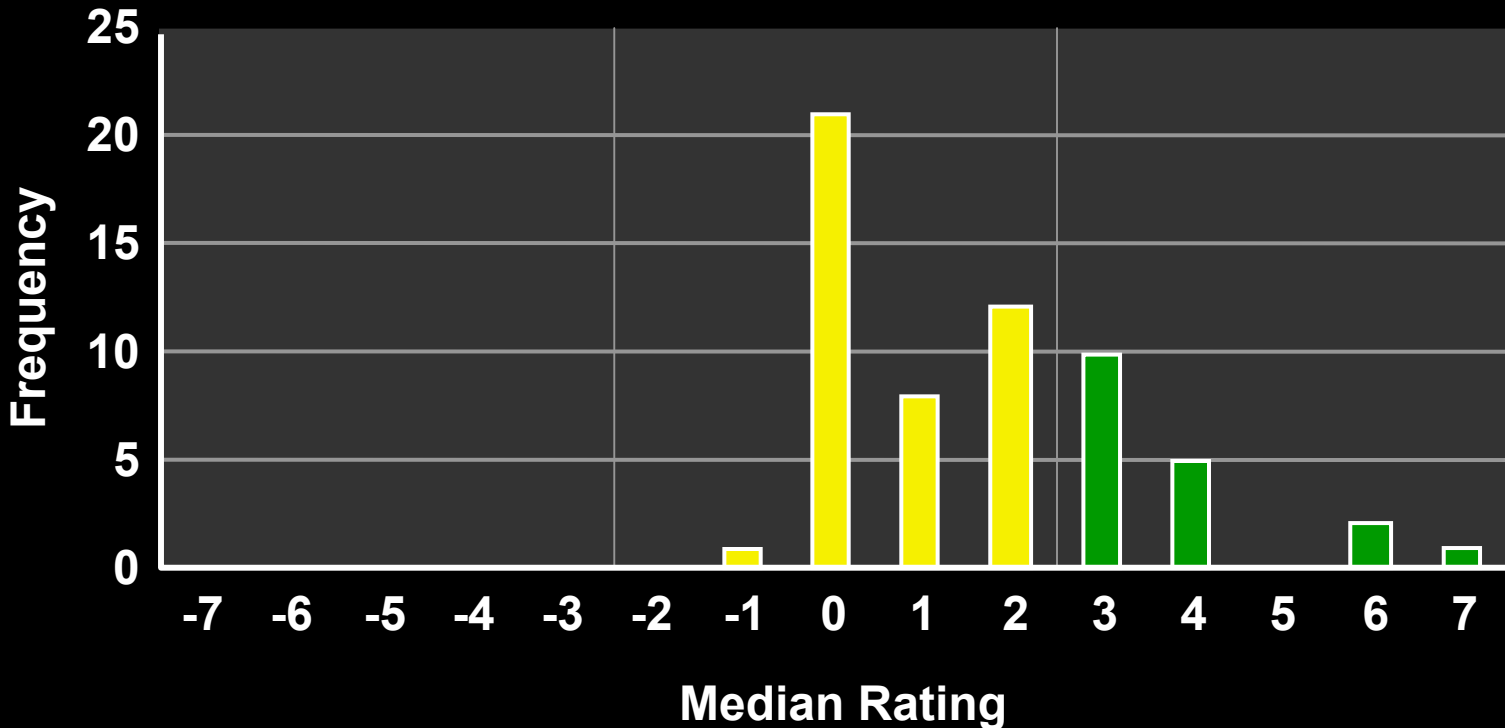
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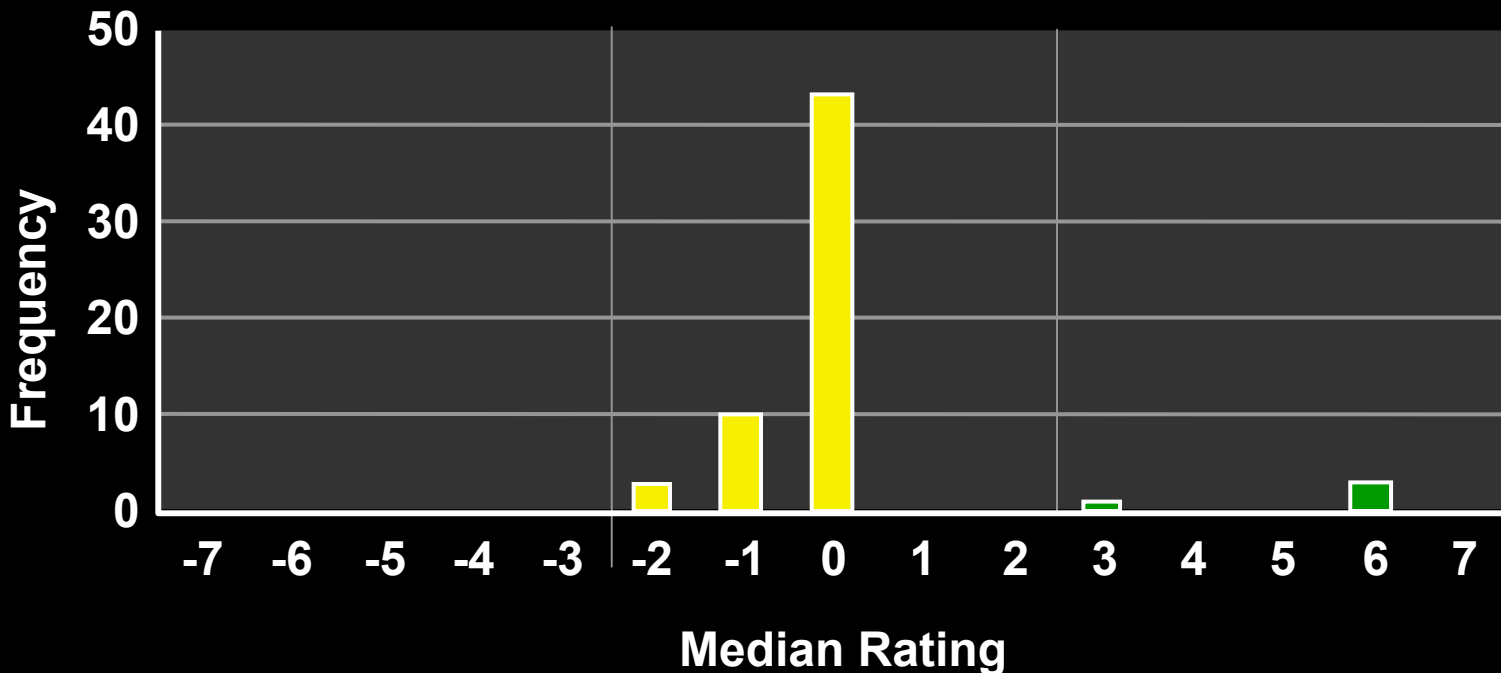
Promoting Clinician Acceptance

- **55 rated in the "clearly positive" range**

Median Ratings of the 60 Recommendations

Maintaining Patient Privacy

- **4 rated in the "clearly positive" range**

- **43 recommendations rated as achievable in 3 years**

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