HSR&D
Health Services Research & Development Service

Health Information Exchange in the VA

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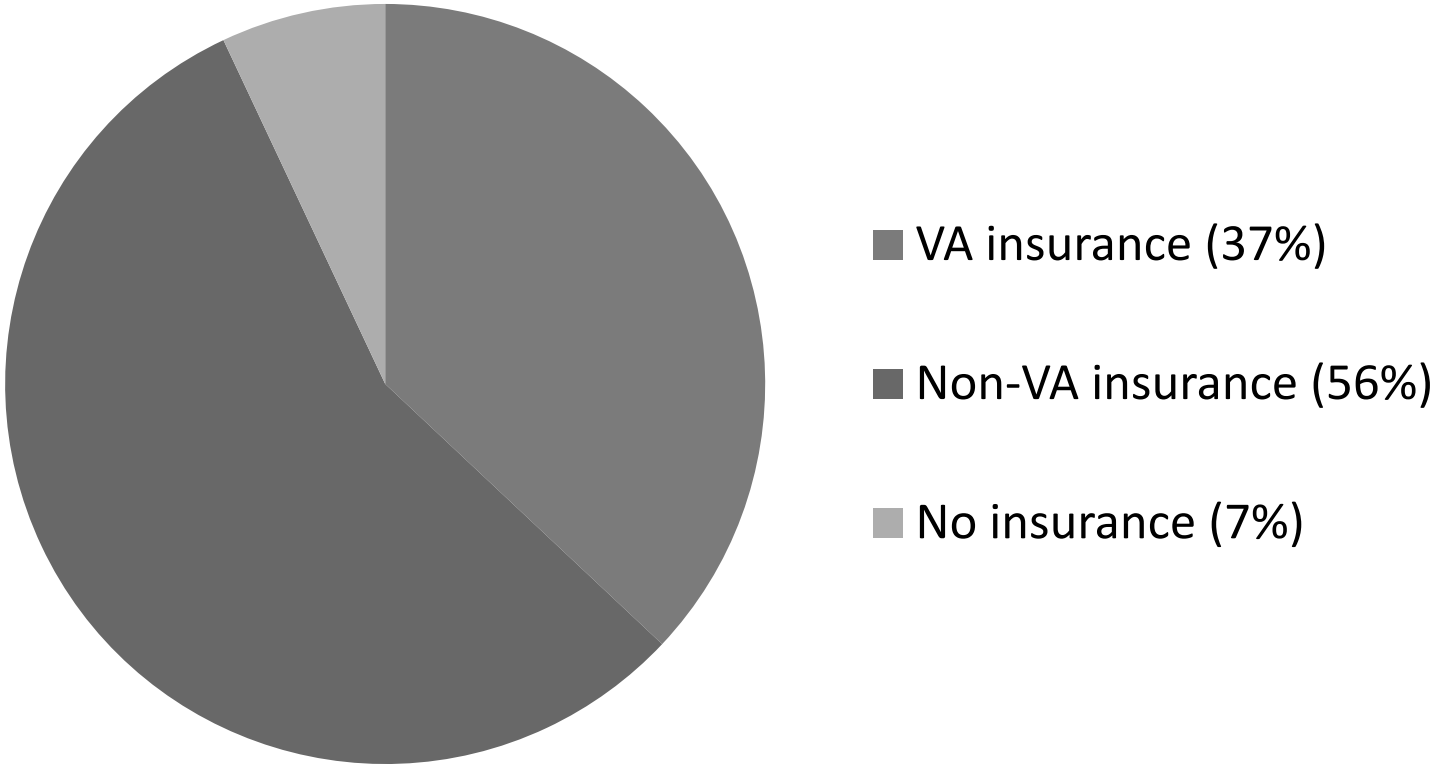
The views expressed in this presentation are those of the authors
and do not necessarily represent the views of the Department of Veterans Affairs.

Agenda for Today

- Understand the need for health information exchange (HIE)
- Learn about health information organizations
- Learn about current approaches to HIE
- Learn about insights from end users
- Gain appreciation of frameworks, measures, and research
- Questions and discussion
- *Not on agenda*: comprehensive review, results of VA evaluation, extensive technical details

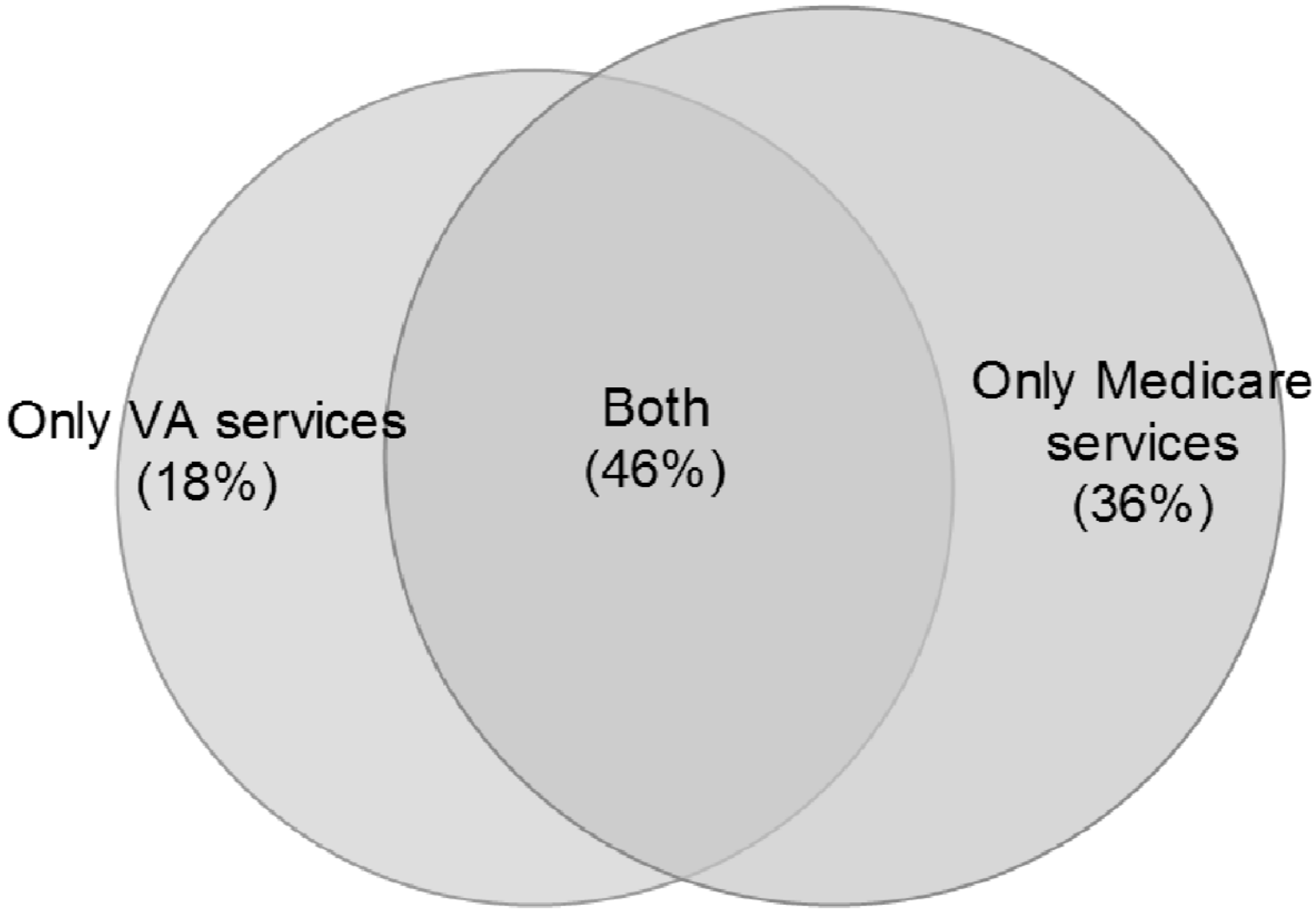
Veterans make transitions in care

- There are no closed systems of care
- About half of Veterans receive care outside VA (estimates up to 70%)
- More than 80% of older Veterans (65+) also have Medicare
- 25% have at least two non-VA federal health plans



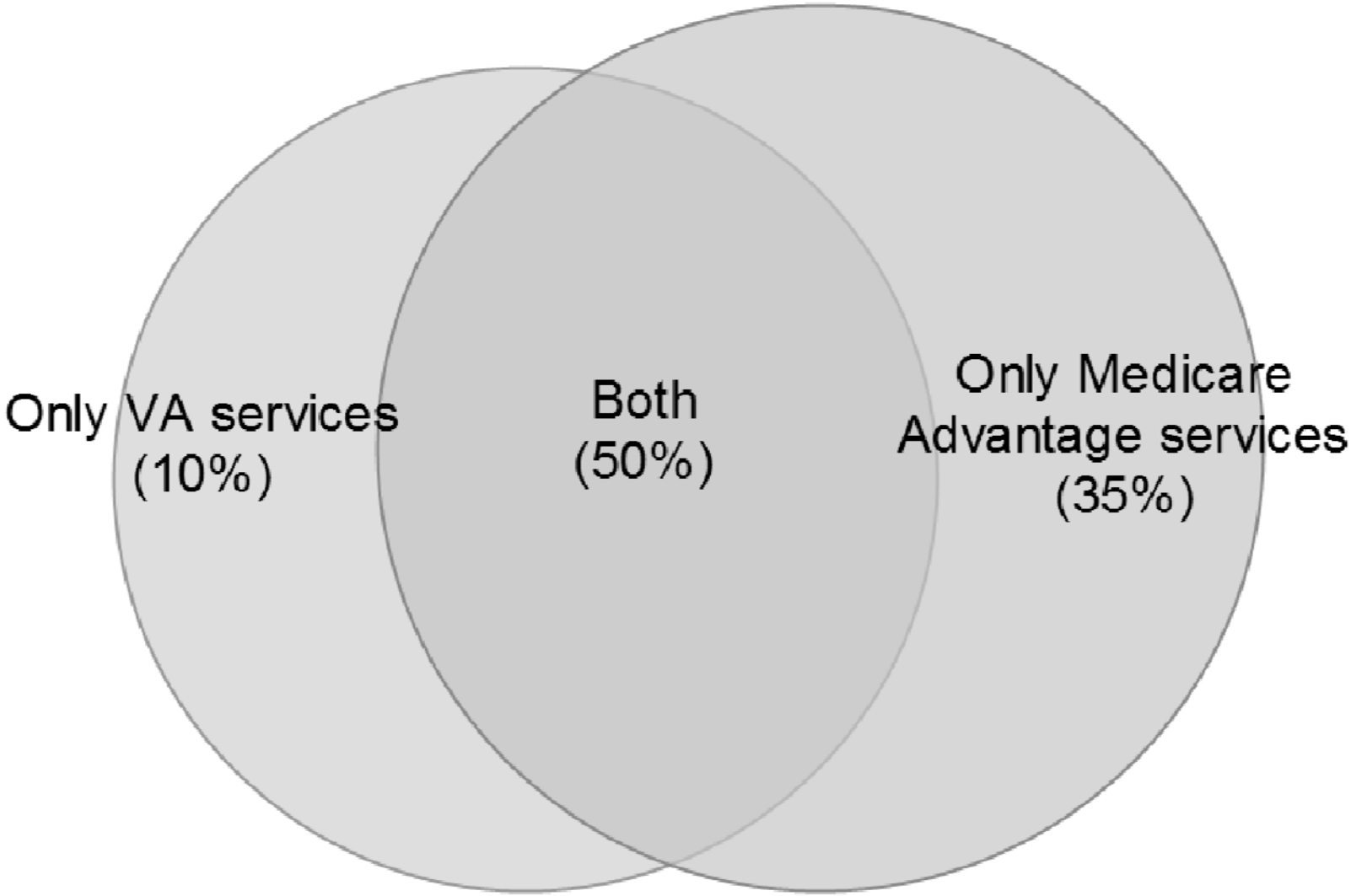
Kizer KW, JAMA 2012; 307 (8):789-90.
Shen Y *et al.*, Med Care Res Rev 2003; 60 (2):253-67.

Medicare-eligible Veterans with outpatient use (1999)



Hynes DM *et al.*, Med Care 2007; 45 (3):214-23.

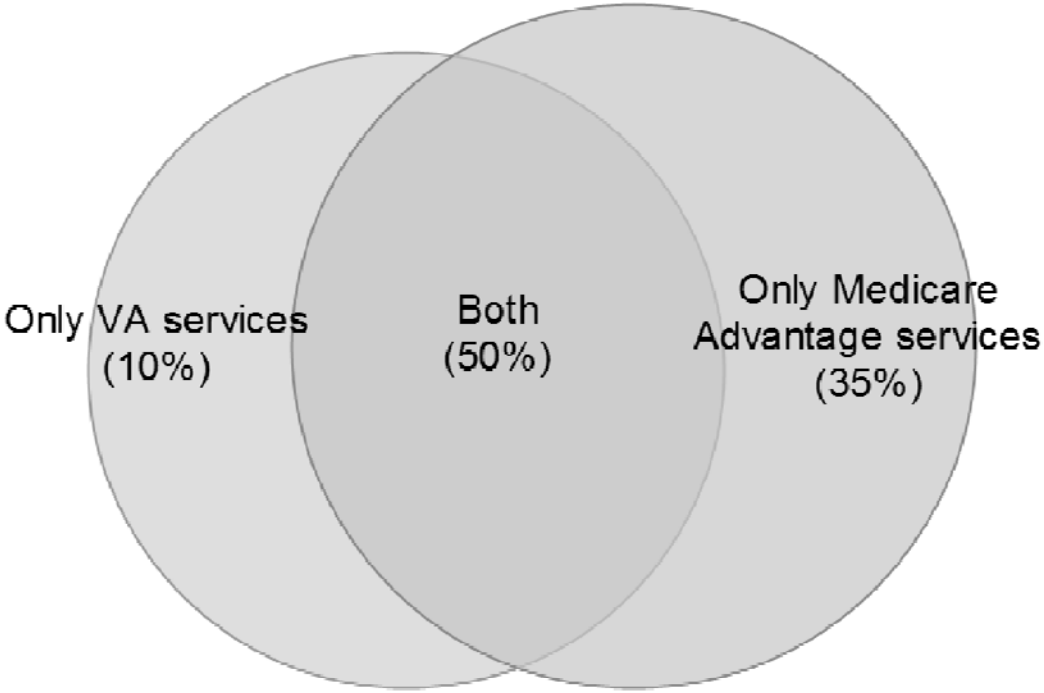
Medicare Advantage in Veterans (2009)



Trivedi AN *et al.*, JAMA 2012; 308 (1):67-72.

Medicare Advantage in Veterans (2009)

- Dual enrollment increased by 90% to 924,792 from 2004 to 2009
- VA paid $13 billion for Medicare Advantage enrollees over 6 years



Trivedi AN *et al.*, JAMA 2012; 308 (1):67-72.

Meaningful use of electronic health record (EHR) systems

- Using EHR technology to improve care, coordination, and security, while engaging patients
- Stage 1 (2011-2012; encouraged): capture and share data
- Stage 2 (2014; required): advance clinical processes
- Stage 3 (2015): improve outcomes

Meaningful use of electronic health record (EHR) systems

- Using EHR technology to improve care, coordination, and security, while engaging patients
- Stage 1 (2011-2012; encouraged): capture and share data
  - Entry of basic patient data
  - Electronic prescribing with decision support
  - **Ability to exchange structured health information**
  - Additional options
- Stage 2 (2014; required): advance clinical processes
- Stage 3 (2015): improve outcomes

Meaningful use of electronic health record (EHR) systems

Eligible providers and hospitals must electronically transmit summary in at least 10% of transfers or referrals.

mprove care, coordination,
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data

- Entry of basic patient data
- Electronic prescribing with decision support
- <u>Ability to exchange structured health information</u>
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- Stage 2 (2014; **<u>required</u>**): advance clinical processes
- Stage 3 (2015): improve outcomes

What is health information exchange?

"The electronic movement of health-related information among organizations according to nationally recognized standards"

- Includes clinical and administrative data
- Organizations are often diverse and competing

The National Alliance for Health Information Technology <http://healthit.hhs.gov/defining_key_hit_terms>.
Dixon BE *et al.*, J Am Med Inform Assoc 2010; 17 (3):295-301.

Governance and standards can support medical decisions and care

- The public-private Health Information Technology Standards Panel formalized HIE standards
- **Continuity of Care Document** (CCD) summarizes a patient's medical status
- Newer groups and approaches have evolved

HITSP Summary Documents Using HL7 Continuity of Care Document (CCD) Component

HITSP/C32

HITSP

Healthcare Information Technology Standards Panel

HL7 INTERNATIONAL

Health Level Seven International

Nationwide Health Information Network (NwHIN)

- Standards, services, and policies enabling HIE via Internet

- NwHIN Exchange: collaborators exchanging information
  - Participants
    - Federal and public-health entities
    - Integrated delivery networks
    - Private organizations
    - Health information organizations
  - Transitioning to HealtheWay, a public-private partnership

Examples of exchangeable information

- Information source
- Language spoken
- Personal information
- Problem list
- Advance directives
- Allergies
- Problem list
- Progress notes
- Discharge summaries

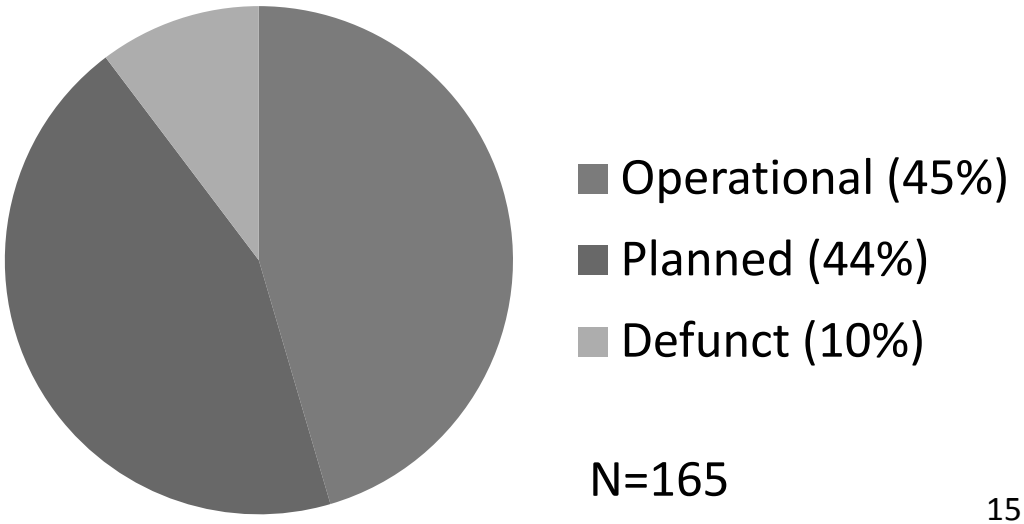
- Healthcare providers
- Immunizations
- Insurance provider
- Medications
- Plan of care
- Pregnancy status
- Procedures
- Vital signs
- Diagnostic results

The health information organization

- Oversees HIE
- Uses nationally recognized standards
- Provides interoperability, security, and confidentiality
- Ensures authorization of those who access information

Health information organizations

- In 2009, U.S. had about 197 regional health information organizations
- 45% operational, covering 14% of hospitals and 3% of ambulatory practices
- 33% financially viable
- U.S. government provided startup funding



Adler-Milstein J *et al.*, Ann Intern Med 2011; 154 (10):666-71.

Indiana Health Information Exchange (IHIE)

- Statewide network with “virtual record”
- Operates largest HIE in the U.S.
  - Over 12 million patients, 19,000 physicians, 90 hospitals, 110 other healthcare organizations (long-term care and rehabilitation facilities, clinics, imaging centers, community health centers)
  - 3 billion pieces of clinical data: 80 million radiology images, 50 million text reports, 750,000 EKGs; discharge summaries, operative notes, pathology reports, and medication records
- Encounters from 90% of care provided at Indianapolis-area hospitals
- Over a million health transactions daily
- Partners with Regenstrief Institute at Indiana University

HIE should consider consumers' preferences

- New York survey (N=170)
- 67% were comfortable with HIE process of automatic central data storage
- Primary care doctor should have emergency access without permission (93%)
- Most want:
  - Permission before routine viewing by primary care doctor (64%)
  - Ability to see who has viewed their information (86%)
  - Ability to stop electronic storage of data (84%)
  - Ability to stop all viewing (83%)
  - Ability to select which parts are shared (78%)
- 51% would trust practice to regulate security and privacy

Dhopeshwarkar RV *et al.*, Ann Fam Med 2012; 10 (5):428-34.

Virtual Lifetime Electronic Record (VLER)

- Announced by President Obama in 2009
- For streamlined transitions of patients and their administrative and medical records, starting with military service
- Five capability areas defined by functionality
- VLER Capability Area 1 ("VLER Health“) chartered DoD/VA Interagency Program Office to pursue interoperability with private-sector providers
- Integrated electronic health record will use HIE to facilitate care for individuals served by DoD, VA, other agencies (e.g., Social Security Administration)
- Intended benefits: continuity, quality, timeliness, safety, redundancy

VLER: 13 active sites; more on the way

- Sites
  - VA and DoD: Hampton, Puget Sound, San Diego, Spokane
  - VA only: Altoona, Asheville, Buffalo, Charleston, Grand Junction, Indianapolis, Minneapolis, Richmond, Salt Lake City
- Opt-in process
  - Veteran completes authorization form (N=52,767)
  - Veteran's identity is authenticated
  - Authorization form is validated and entered into system
  - NwHIN Exchange Partner may require additional consent
- Correlation (matching) of patients across systems
  - NwHIN Exchange Partner systems try to match Veteran's identity to their records
  - Missing SSN, absence of visits, and other factors can prevent matching
- Evaluation underway

User interface for clinicians

Computerized Patient Record System (CPRS)

VistA CPRS in use by:

File Edit View Tools Help

CHDRZZZTESTPATIENT,CHDRONE (OUTPATIENT)
666-00-0001 Mar 03,1960 (50)

Visit Not Selected
Provider:

Primary Care Team Unassigned

Pt Insur | Flag | VistaWeb | Remote Data | Postings A

Active Problems

- Peptic Ulcer, Acute/Chronic
- * Foot Pain
- * Arteriosclerosis Heartr Disease
- Arthritis, Rheumatoid

Allergies / Adverse Reactions

- Shellfish
- Aspirin
- Waterfowl
- Peanuts

Postings

- Allergies

Active Medications

Allopurinol 300mg Tab	Active
Non-VA Magnesium Hydroxide Susp,Oral	Active
Non-VA A & D Oint	Active
Non-VA Milk Of Magnesia	Active
Clin Meds Docusate Soln,Oral	Pending

Clinical Reminders

	Due Date
Needs Vesting Exam	DUE NOW
Primary Care Provider Assignment	DUE NOW
TBI Screening	DUE NOW
Iraq&Afghan Post-Deployment Screen	DUE NOW
Annual Influenza Vaccination	DUE NOW
Pneumococcal vaccine	DUE NOW
Tetanus Immunization	DUE NOW
Healthwise for Life Book	DUE NOW
Outpatient Learning Screening	DUE NOW
Hepatitis C Risk Factor Screening	DUE NOW
HTN Lipid Profile	DUE NOW
VLER HEALTH ENROLLED	DUE NOW

Recent Lab Results

No Orders Found.

Vitals

T	98.6 F	May 07,2010 12:27	(37.0 C)	
P	80	May 07,2010 12:27		
R	20	May 07,2010 12:27		
BP	120/80	May 07,2010 12:27		L ARM
HT	70 in	May 07,2010 12:27	(177.8 cm)	
WT	177 lb	May 07,2010 12:27	(80.3 kg)	ACTUAL,CHAIR
PN	0	May 07,2010 12:27		

Appointments/Visits/Admissions

Oct 05,2010 14:01 Testing Noncount>Non-Count

Cover Sheet | Problems | Meds | Orders | Notes | Consults | Surgery | D/C Summ | Labs | Reports

List of Data Sources

VistAWeb: Patient Record - Windows Internet Explorer

File Edit View Favorites Tools Help

VistAWeb: Patient Record

vistaWEB

Logoff

- VTA
- Sites
- Care Team
- Allergies*‡
- Appointments
- Patient Information
- Visits/Admissions
- Dietetics
- Consults and Procedures‡
- Consults (DoD Remote Data Only)
- Discharge Summaries†
- Laboratory †
- Anatomic Path Reports
- Medicine ‡
- Orders
- Outpatient Encounters/GAF
- Pharmacy *‡
- Problem List‡
- Progress Notes‡
- Other Notes
- Radiology †
- Surgery Reports†
- Vital Signs*‡
- Health Summaries (Non-VA)‡
- Health Summaries (CHYSHR)
- Health Summaries (DAYTSHR)

Refresh Patient Data

* - Pages with HDR data
‡ - Pages with NwHIN data

Warning! Avoid using "Back" button

Sites & Notices CHDRZZZTESTPATIENT,CHDRONE (666-00-0001) medical record

Patient Selection

Site Connection Summary (10/13/2011 08:37)

Data for this patient can be retrieved from the following sites:

Site Name	Patient Name	SSN	DOB	Deceased Date	Sensitivity	Last Seen
Southern California Kaiser Permanente (KP) (*NwHIN*) Disclaimers	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
MedVirginia - HIE (*NwHIN*) Disclaimers	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
Department of Defense (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
Inland Northwest Health Services (INHS) - HIE (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
Utah Health Information Network (UHIN) - HIE (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
Indiana Health Information Exchange (IHIE) - HIE (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
Community Health Information Collaborative (CHIC) - HIE (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
South Carolina Health Information Exchange (SCHIEx) - HIE (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
MultiCare Health System (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
Western New York HealtheLink - HIE (*NwHIN*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			
CHYSHR for NwHIN (*CHYSHR*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960		Y	07/20/2011
DAYTSHR for NwHIN (*DAYTSHR*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960		Y	07/28/2011
HDR (*HDR*)	CHDRZZZTESTPATIENT,CHDRONE	666000001	03/03/1960			

Data for this patient cannot be retrieved from the sites shown below due to network or remote system problems. To attempt to reach those systems again, please see the message field below and/or [illegible] the patient .

Site Name	Message	Last Seen
DAYTDEV (*DDEV*)	[illegible] could be made because the target machine actively refused it 10.4.229.201:9503	

There is also a stand-alone version of Vi[illegible] spawned from the CPRS Tools menu. This version is for users who need to select patients from sites other than their home site. The URL is https://vistaweb.med.va.gov.

In case of any problem, please contact your loca[illegible]ter support staff or IT Help Desk.

VistaWeb is a product of the Office of Information

Version 15.0.0.14.9.13.2011 Build last updated: 9/13/2011

Done Local intranet 100%

Double dagger indicates non-VA sources of data

Details -- Webpage Dialog

Table of Contents

- Allergies
- History of Encounters
- History of Procedures
- Immunizations
- Lab Results - Chemistry and Hematology
- Medications - Prescription and Non-Prescription
- Problems/Conditions
- Vital Signs

Allergies

Allergens - Count (8)	Verification Date	Event Type	Reaction	Severity	Source
POISON IVY/POISON OAK/PO	May 24, 2011	Propensity to adverse reactio	MILD, RASH	MILD	KAISER PERMANENTE
ASPIRIN	Aug 11, 2010	Propensity to adverse reactio	MILD, RASH	MILD	KAISER PERMANENTE
CODEINE	May 6, 2010	Propensity to adverse reactio	MODERATE, NAUSEA,VOMIT	MODERATE	KAISER PERMANENTE
PEANUTS	May 6, 2010	Propensity to adverse reactio	SEVERE, ANAPHYLAXIS	SEVERE	KAISER PERMANENTE
BIAXIN 500MG XL TAB	May 6, 2010	Propensity to adverse reactio	SEVERE, SHORTNESS OF BRE	SEVERE	KAISER PERMANENTE
PENICILLIN	May 6, 2010	Propensity to adverse reactio	MILD, NAUSEA,VOMITING,	MILD	KAISER PERMANENTE
LATEX	Jan 15, 2010	Propensity to adverse reactio	MODERATE, RASH	MODERATE	KAISER PERMANENTE
OUTDOOR MOLD	Dec 29, 2009	Propensity to adverse reactio	MILD, WHEEZING, RHINITIS	MILD	KAISER PERMANENTE

History of Encounters

NOTE: Click on the Encounter Comments field to display/hide additional data where applicable

Date/Time - Count (12)	Encounter Type	Encounter Comments	Provider
Jan 24, 2012	OFFICE VISIT	PRIMARY CARE/MEDICINE	TEST, PROVIDER6 MD
Jul 14, 2011	OFFICE VISIT	PRIMARY CARE/MEDICINE	TEST, PROVIDER6 MD
Sep 22, 2010	OFFICE/OUTPATIENT VISIT, EST	ADMIN PAT ACTIVTIES	TEST, PROVIDER3 MD
May 6, 2010	OFFICE CONSULTATION	GENERAL INTERNAL MEDICINE with associated notes .PF	TEST, PROVIDER2 MD
May 6, 2010	OFFICE CONSULTATION	GENERAL INTERNAL MEDICINE	TEST, PROVIDER2 MD
Mar 24, 2010	OFFICE/OUTPATIENT VISIT, EST	ALLERGY IMMUNOLOGY	TEST, PROVIDER4 MD
Feb 16, 2010	OFFICE CONSULTATION	GENERAL INTERNAL MEDICINE	TEST, PROVIDER4 MD

History of Procedures

NOTE: Click on the Procedure Comments field to display/hide additional data where applicable

Date/Time - Count (9)	Procedure Type	Procedure Comments	Provider
Jul 20, 2011	BONE AND/OR JOINT IMAGING; THREE P	BONE AND/OR JOINT IMAGING: THREE P	TEST, PROVIDER5 MD
Jul 20, 2011	BONE MARROW IMAGING; LIMITED ARE	BONE MARROW IMAGING: LIMITED ARE	TEST, PROVIDER5 MD
Jul 20, 2011	BONE AND/OR JOINT IMAGING; TOMOGR	BONE AND/OR JOINT IMAGING: TOMOGR	TEST, PROVIDER5 MD
Dec 27, 2010	KNEE ASPIRATION	Associated Notes: OPERATIVE REPORT.RI	TEST, PROVIDER1 MD

Summary of Care Record (C32)

For C32 data sections, the date ranges are preset by the health information organization

Department of Veterans Affairs Summarization of Episode Note

File Edit View Favorites Tools Help

Back Search Favorites

Address C:\VA Docs\Version 2\new data access\C32 partner exchange\VA\CH Go Links Austin local 216 217 CACI DOS Frank Java stuff javascript

Vomiting	Active	787.03	Jul 28, 93	HASHEMZADEH,DARIOUSH	DAYTON

Medications - Prescription and Non-Prescription

Medications	Status	Quantity	Order Expiration	Provider	Prescription NBR	Dispense Date	Sig	Source
AMLODIPINE BESYLATE 5MG TA	active	45	Dec 30, 10	INLOES,SONJA	762914	Dec 29, 09	TAKE ONE-HALI	CHEYENNE VAN
CLOPIDOGREL BISULFATE 75MG	active	90	Dec 30, 10	INLOES,SONJA	762915	Dec 29, 09	TAKE ONE TABI	CHEYENNE VAN
WARFARIN NA 1MG TAB	active	45	Dec 30, 10	INLOES,SONJA	762916	Dec 29, 09	TAKE ONE-HALI	CHEYENNE VAN
CLARITHROMYCIN 250MG TAB	active	90	Jan 1, 11	HASHEMZADEH,DARI(	2718221	Dec 31, 09	TAKE ONE TABI	DAYTON

Vital Signs

Date	TEMP	PULSE	RESP	BP	Ht	Wt	POx	Source
Feb 23, 10	98.6	76	20	130 / 80	72	210	99	CHEYENNE VAMC
Apr 21, 10	100	73	80	140 / 85	70			DAYTON
Feb 17, 10	98.2	75	20	146 / 82	72			DAYTON

Lab Results - Chemistry and Hematology

Results	Date	Result - Unit	Interp	Ref Range	Source	Comments
Glucose [Mass/volume] in Serum or Plasma	Apr 21, 10	150 mg/dl	H	65:110	DAYTSHR TEST LAB	hello there
Ethanol [Mass/volume] in Urine	Feb 22, 10	NEG mg/dl		0:10	DAYTSHR TEST LAB	~For Test: DRUG ABUS
Diazepam [Presence] in Urine	Feb 22, 10	POS			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Opiates cutoff [Mass/volume] in Urine for Screen method	Feb 22, 10	NEG			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Benzoylecgonine cutoff [Mass/volume] in Urine	Feb 22, 10	NEG			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Cannabinoids cutoff [Mass/volume] in Urine for Screen method	Feb 22, 10	POS			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Amphetamine cutoff [Mass/volume] in Urine for Screen method	Feb 22, 10	NEG			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Barbiturate screen absent [Identifier] in Urine	Feb 22, 10	NEG			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Phencyclidine [Presence] in Urine by Screen method >25 ng/mL	Feb 22, 10	NEG			DAYTSHR TEST LAB	~For Test: DRUG ABUS
Cholesterol.in HDL [Mass/volume] in Serum or Plasma	Feb 22, 10	150 mg/dl	H	35:55	DAYTSHR TEST LAB	hello this is a comment
Glucose [Mass/volume] in Serum or Plasma	Feb 19, 10	115 mg/dl	H	65:110	DAYTSHR TEST LAB	
Glucose [Mass/volume] in Serum or Plasma	Feb 17, 10	300 mg/dl	H	65:110	DAYTSHR TEST LAB	hello
Creatine kinase [Enzymatic activity/volume] in Serum or Plasma	Feb 17, 10	pending U/L		24:349	DAYTSHR TEST LAB	SONJA - TESTING
Creatine kinase.MB [Mass/volume] in Serum or Plasma	Feb 17, 10	pending ng/ml		0:5.8	DAYTSHR TEST LAB	SONJA - TESTING

Details -- Webpage Dialog

Problems

Problems - Count (11)	Status	Problem Code	Date of Onset	Provider	Source
BRONCOPNEUMONIA ORG NOS	completed	485	--	Jahn, DRTEST	Meditech
CARDIAC MURMURS NEC	completed	785.2	--	Jahn, DRTEST	Meditech
BRONCOPNEUMONIA ORG NOS	completed	485	--	Jahn, DRTEST	Meditech
URIN TRACT INFECTION NOS	completed	599.0	--	Aarrestad, Desiree	Meditech
DIAB MELL WO COMPL, TYPE II OR UN	completed	250.00	--	Aarrestad, Desiree	Meditech
E. COLI INFECT NOS	completed	041.4	--	Aarrestad, Desiree	Meditech
HYPERTENSION NOS	completed	401.9		Aarrestad, Desiree	Meditech
CONGESTIVE HEART FAILURE NOS	completed	428.0	--	Aarrestad, Desiree	Meditech
ACUTE CYSTITIS	completed	595.0	--	Aarrestad, Desiree	Meditech
	completed	--	--	--	Inland Northwest Health
	completed	--	--	--	Inland Northwest Health

Results

Date/Time - Count (81)	Result Type	Source	Result - Unit	Interpretation
Dec 14, 2011	GLOMERULAR FILTRATION RATE,EST	Meditech	--	--
--	Glomerular filtration rate/1.73 sq M.predicted	--	>60	--
Dec 14, 2011	AST	Meditech	--	--
--	Aspartate aminotransferase	--	34 U/L	--
Dec 14, 2011	ALKALINE PHOSPHATASE	Meditech	--	--
--	Alkaline phosphatase	--	25 U/L	L
Dec 14, 2011	ALT	Meditech	--	--
--	Alanine aminotransferase	--	55 U/L	H
Dec 14, 2011	BILIRUBIN, TOT	Meditech	--	--
--	Bilirubin	--	1.0 mg/dL	--
Dec 14, 2011	ALBUMIN	Meditech		
--	Albumin	--	3.9 g/dL	--
Dec 14, 2011	PROTEIN, TOT	Meditech	--	--
--	Protein	--	9.0 g/dL	H
Dec 14, 2011	CALCIUM	Meditech	--	--
	Calcium		9.7 mg/dL	
Dec 14, 2011	GLUCOSE	Meditech	--	--
--	Glucose	--	66 mg/dL	--
Dec 14, 2011	UREA NITROGEN	Meditech	--	--
--	Urea nitrogen	--	8 mg/dL	--
Dec 14, 2011	CREATININE	Meditech	--	--
--	Creatinine	--	0.55 mg/dL	--
Dec 14, 2011	ANION GAP	Meditech	--	--
--	Anion gap 4	--	4 mmol/L	L
Dec 14, 2011	CO2	Meditech	--	--
--	Carbon dioxide	--	22 mmol/L	--
Dec 14, 2011	CHLORIDE	Meditech	--	--
--	Chloride	--	109 mmol/L	--

https://vistaweb.med.va.gov/Details.aspx?subd=AsyncDetailControl.ascx&subc=BlankClipboardControl.ascx&ad=NhinDetailPage.aspx&ac

Local Intranet

Aggregated view

VistAWeb: Patient Record - Windows Internet Explorer

File Edit View Favorites Tools Help

VistAWeb: Patient Record

Page · Tools ·

VistaWEB

Logoff

- VTA
- Sites
- Care Team
- Allergies*‡
- Appointments
- Patient Information
- Visits/Admissions †
- Dietetics
- Consults and Procedures‡
- Consults (DoD Remote Data Only)†
- Discharge Summaries‡
- Histories and Questionnaires (DoD Remote Data Only)
- Laboratory ‡
  - Autopsy
  - Blood Availability
  - Blood Transfusion
  - Blood Bank Report
  - Surgical Pathology†
  - Cytology†
  - Electron Microscopy†
  - Lab Orders†
  - Chem & Hematology†‡
  - Microbiology†
  - Lab Summaries
  - Pathology Studies (Non-VA Only)‡
- Anatomic Path Reports
- Medicine ‡
- Orders
- Outpatient Encounters/GAF †
- Pharmacy *‡
- Problem List‡‡
- Progress Notes‡‡
- Other Notes
- Radiology ‡‡
- Surgery Reports‡
- Vital Signs*‡‡
- Health Summaries (Non VA)‡
- Health Summaries (CHA)
- Health Summaries (NJS)

Warning! Avoid using "Back" button

Chem & Hematology CHDRZZZTESTPATIENT,CHDRONE (666 00 0001) medical record

Patient Selection

This page uses pop-up windows.
Click here for help on enabling pop-ups.

Date Range: ○ Today ○ One Week ○ Two Weeks ○ One Month ○ Two Months ○ Six Months ◉ One Year ○ Two Years ○ All Dates

From: (mm/dd/yyyy) To: (mm/dd/yyyy) Query

Maximum Number/Site: 50 ☐ All Reports

A maximum of 50 reports per site will be displayed regardless of the number of reports available within the specified date range.

Date range information for NwHIN data

Print Report

View Details	Icon	Date	Test Name	Specimen	Result	Flag	Units	Ref Range	Comment	Site
View Detail		12/13/2011 14:14	Creatinine	Plasma	TNP		mg/dL	(0.8-1.3)	For Test: GFR - This calculation is an estimated Glomerular Filtration Rate (mL/min/1.73 m2) based on the MDRD equation. A result of >60 mL/min/1.73 m2 is considered normal. This equation should only be used for patients 18 and older. The value has been derived from the MDRD equation: eGFR (mL/min/1.73 m2) = 186 x (Scr)-1.154 x (Age)-0.203 x (0.742 if female) (calc is not taking into account race (x 1.21 if African American)).	NH GREAT LAKES†
View Detail		12/13/2011 14:14	GFR	Plasma	TNP			(60)	For Test: GFR - This calculation is an estimated Glomerular Filtration Rate (mL/min/1.73 m2) based on the MDRD equation. A result of >60 mL/min/1.73 m2 is considered normal. This equation should only be used for patients 18 and older. The value has been derived from the MDRD equation: eGFR (mL/min/1.73 m2) = 186 x (Scr) 1.154 x (Age) 0.203 x (0.742 if female) (calc is not taking into account race (x 1.21 if African American)).	NH GREAT LAKES†
View Detail		02/10/2010 00:00	D-DIMER SEMI QT.		0.69	ABOVE HIGH NORMAL	MG/L FEU	0.00-0.65		MedVirginia - HIE‡
View Detail		03/31/2011 00:00	Carbon dioxide		24 mmol/L		Not Available	21-28		Inland Northwest Health Services (INHS) - HIE‡
View Detail		03/31/2011 00:00	Anion gap 4		7 mmol/L		- Not Available -	5-16		Inland Northwest Health Services (INHS) - HIE‡
View Detail		03/31/2011 00:00	Chloride		109 mmol/L		- Not Available -	98-109		Inland Northwest Health Services (INHS) - HIE‡

Local intranet 100%

- For VA data, date ranges can be specified for various types of data
- For non-VA data, date ranges can be specified only for clinical notes

Clinical Notes

VistAWeb: Patient Record - Windows Internet Explorer

https://vistaweb2.med.va.gov/v15/AppFrameset2.htm

File Edit View Favorites Tools Help

VistAWeb: Patient Record

vistaWEB

Logoff

- VTA
- Sites
- Care Team
- Allergies*‡
- Appointments
- Patient Information
- Visits/Admissions
- Dietetics
- Consults and Procedures‡
- Consults (DoD Remote Data Only)
- Discharge Summaries‡
- Laboratory ‡
- Anatomic Path Reports
- Medicine ‡
- Orders
- Outpatient Encounters/GAF
- Pharmacy *‡
- Problem List‡
- Progress Notes‡
- Other Notes
- Radiology ‡
  - Radiology Reports‡
  - Imaging
- Surgery Reports‡
- Vital Signs*‡
- Health Summaries (Non-VA)‡
- Health Summaries (CHYSHR)
- Health Summaries (DAYTSHR)

Refresh Patient Data

* - Pages with HDR data
‡ - Pages with NwHIN data

Warning! Avoid using "Back" button

Consults CHDRZZZTESTPATIENT,CHDRONE (666-00-0001) medical record

Patient Selection

This page uses pop-up windows.
Click here for help on enabling pop-ups.

Date Range: ○ Today ○ One Week ○ Two Weeks ○ One Month ○ Two Months ○ Six Months ◉ One Year ○ Two Years ○ All Dates
From: (mm/dd/yyyy) To: (mm/dd/yyyy) Query

Print Report

View Details	Icon	Consult Date/Time	Status	Consult Type	VA Service or NwHIN Note Title	Site
View Detail	No Icon	10/13/2011 11:48			Consultation Note	Department of Defense‡
View Detail	No Icon	10/13/2011 11:43			Consultation Note	Department of Defense‡
View Detail	No Icon	10/13/2011 11:43			Consultation Note	Department of Defense‡
View Detail	No Icon				Error code: XDSUnknownPatientId, severity: urn:oasis:names:tc:ebxml regrep:ErrorSeverityType:Error, value: , location: , codeContext:	NwHIN‡
View Detail		07/20/2011 14:47	(p)	C	CARDIOPULMONARY-RESP THER	CHYSHR for NwHIN
View Detail		07/20/2011 14:47	(p)	C	CARDIOPULMONARY-SLEEP SCAN	CHYSHR for NwHIN

[back to top]

Done Local intranet 100%

Clinical Notes: details

NwHinDocDetail Viewer - Mozilla Firefox

va.gov https://vistawcb2.med.va.gov/v15/NwHinDocDetailFrameset.aspx?sessionGuid=bb51cf0b-d57f-11c2-91c3-c91dbd7b3088&property=C

Close

CHDRZZZTESTPATIENT,CHDRONE (666-00-0001)

Document Class: Consultation Note
Site:
Date: 08/08/2011 17:22 Author: AHLTA, ATTEND A

Doc Title: Consultation Note - OFFICE CONSULTATION
Date of Note: 00/00/2011 09:00
Author: AHLTA, ATTEND A
Date Signed: 08/08/2011 09:00
Signed By:

NOTE CONTENT:

The file you have opened complies with the PDF/A standard and has been opened read-only to prevent modification.

Patient: CHDRZZZTESTPATIENT, CHDRONE — Date: 08 Aug 2011 0900 EDT — Appt Type: OPAC$
Treatment Facility: ALL MEDICAL GROUP — Clinic: INTERNAL MEDICINE — Provider: AHLTA,ATTEND A
Patient Status: Outpatient

Reason for Appointment: PROVISIONAL DX FIELD - TESTING VLER
Appointment Comments:
DKC

AutoCites Refreshed by AHLTA ATTEND A @ 08 Aug 2011 1315 EDT

Problems
Chronic:
- Migraine headache
- Fracture of long bones due to birth trauma
- Asthma

Family History
No Family History Found.

Allergies
- Penicillins: Anaphylaxis, Rash, Rash or itch. Other: reaction comment added 2/24 tm (allergy comment added by tennisha 2/24)
- A & D: Nausea and Vomiting. Other: i love watermelon (Rash,Hives)
- A-HYDROCORT. Unknown, Other: lots and lots of itching tenni (Reaction(s):Vomiting,Rash,Hives)
- LACTOSE-FREE FOOD: Urticaria (RASH)
- Aspirin: Anaphylaxis (VLER JOINT test)
- SULFA DRUGS: Unknown (RASH)

Active Medications
No Active Medications Found.

A/P Written by AHLTA ATTEND A @ 08 Aug 2011 1317 EDT
1. SINUSITIS
Medication(s): -GANI-TUSS NR LIQUID--PO LIQ [PENDING PDTS] - SIG #1 RF0 Qt: 1 Rf: 0

Disposition Written by AHLTA ATTEND A @ 08 Aug 2011 1321 EDT
Released w/o Limitations
Follow up: 1 week(s) with PCM or sooner if there are problems.
Discussed: Diagnosis, Medication(s)/Treatment(s), Alternatives, Potential Side Effects with Patient who indicated understanding. - Comments: no comments

Note Written by AHLTA ATTEND A @ 08 Aug 2011 1315 EDT
Consult Order
Referring Provider: CHANNING, DORIAN K
Date of Request: 08 Aug 2011
Priority: Routine

Provisional Diagnosis:

PROVISIONAL DX FIELD - TESTING VLER

Reason for Request:

[back to top] Close

Initial usage

- Physicians, physician assistants, nurses, pharmacy staff, mental-health providers use the system
- 5% of matched Veterans have had at least one inbound disclosure to a VA clinician
  - Veterans may not have had encounters
  - Clinicians might choose not to view data, or may be unaware
  - Similar access to Tennessee study (6.8%)
  - Even low usage may lead to improved care overall
- Outbound disclosures are also occurring

Frisse ME *et al.*, J Am Med Inform Assoc 2012; 19 (3):328-33.

Technical dimensions

- Consider benefits and risks relative to usual care: retrieving NwHIN documents is faster than faxing requests to hospitals and waiting for replies
- Timeouts and other delays can slow data retrieval
- For multiple reasons, documents are retrieved on demand, rather than being locally cached
- Need for usability: "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use"

International Organization for Standardization, ISO 9241.

Insights from End-Users

Findings from other HIE systems

Alissa Russ, PhD

VA HSR&D Center of Excellence on Implementing Evidence-Based Practice
Richard L. Roudebush VA Medical Center
Indianapolis, Indiana

3 studies:

1. Hincapie AL, Warholak TL, Murcko AC, Slack M, Malone DC. Physicians' opinions of a health information exchange. J Am Med Inform Assoc 2011;18:60-5
2. Gadd CS, Ho YX, Cala CM, et al. User perspectives on the usability of a regional health information exchange. J Am Med Inform Assoc 2011;18:711-6.
3. Unertl KM, Johnson KB, Lorenzi NM. Health information exchange technology on the front lines of healthcare: workflow factors and patterns of use. J Am Med Inform Assoc 2011.

1. Hincapie *et al.* 2011

Focus groups:

- Arizona Medical Information Exchange
- 29 physicians

<u>Findings:</u>

- Workflow variation
- HIE useful to prevent 'doctor shopping'
- Helps avoid duplicate testing

1. Hincapie (cont'd)

<u>Identified Challenges:</u>

- Limited data availability (e.g., immunizations, mental health)
- Difficulty finding data
- Workflow efficiency
  - Some physicians relied on others to retrieve information

2. Gadd *et al.* 2011

Cross-sectional survey

- MidSouth eHealth Alliance
- Questionnaire for User Interaction Satisfaction
- 151 respondents: physicians, nurse practitioners, physicians assistants, nurses, others

<u>Findings:</u>

- 3 usability factors were positive predictors of HIE use:
  - Overall reaction
  - Learning
  - Functionality

2. Gadd (cont'd)

Findings (cont):

- Consolidating data in HIE, rather than aggregating, may facilitate implementation and use
- Focus on meeting basic expectations of HIE user base
- Usability may be more important than 'trust'

<u>Identified Challenges:</u>

- Need to improve design and navigation of HIE

3. Unertl *et al.* 2011

Qualitative study

- MidSouth eHealth Alliance
- 6 emergency departments, 8 ambulatory clinics
- Direct observations, interviews

Findings:

- Workflow varied by site and end-user's role
- HIE used for:
  - Pt medical history
  - Discharge summaries
  - Track completion and results of external procedures, biopsies
  - Verifying patient input
  - Referrals

3. Unertl (cont'd)

<u>Identified challenges:</u>

- "Fragmentation of information"
  - EHR system at their site
  - EHR systems from associated sites
  - Data from information exchange
  - Paper forms

Summary from end-users

<u>End-users:</u>

- Find value in HIE
- Likely use a core set of data from HIE
- Need more than just ‘more information’
- Desire systems that will consolidate data from *all* sources

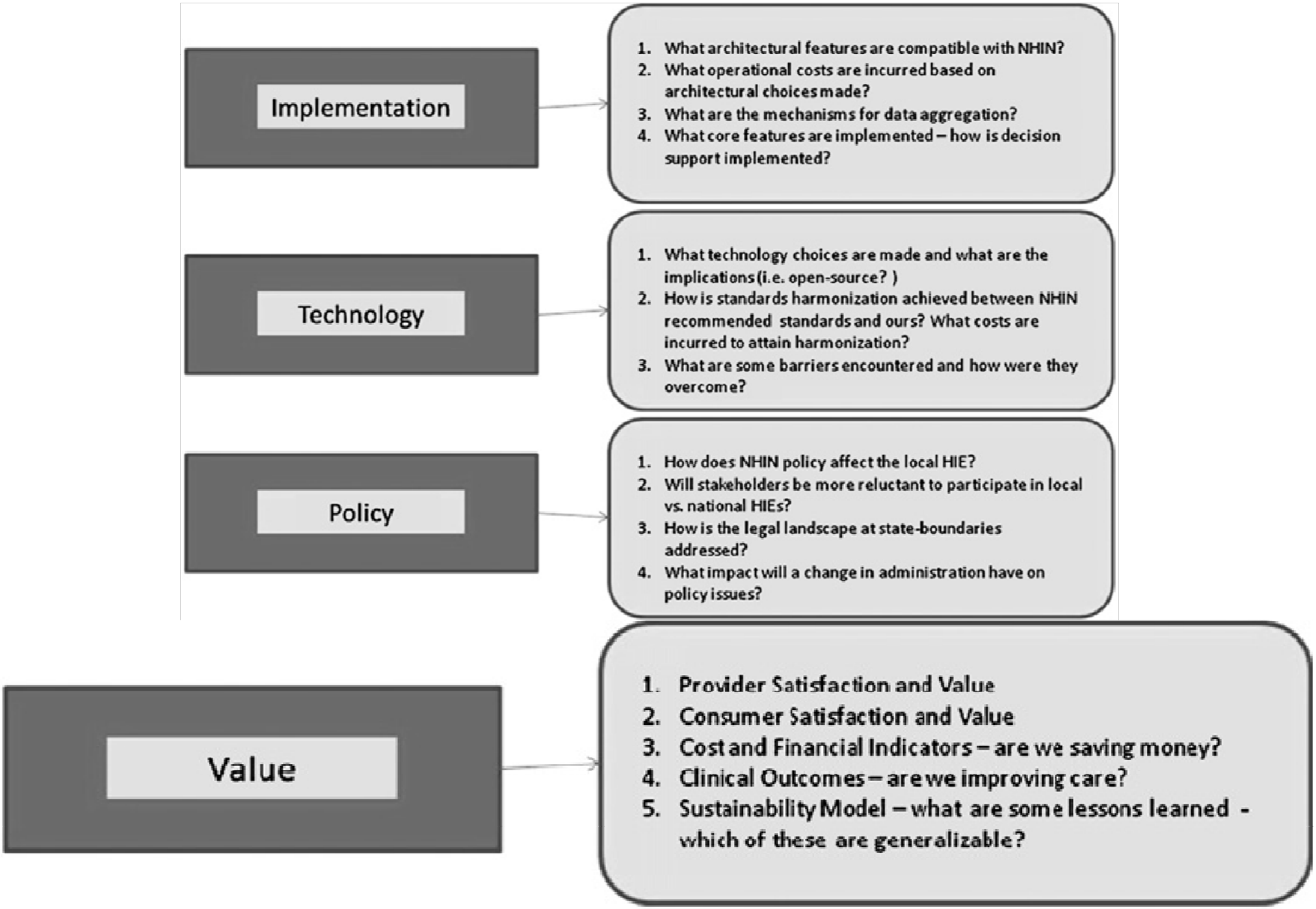
Health information exchange

Frameworks, Measures, Research

David A. Haggstrom, MD, MAS

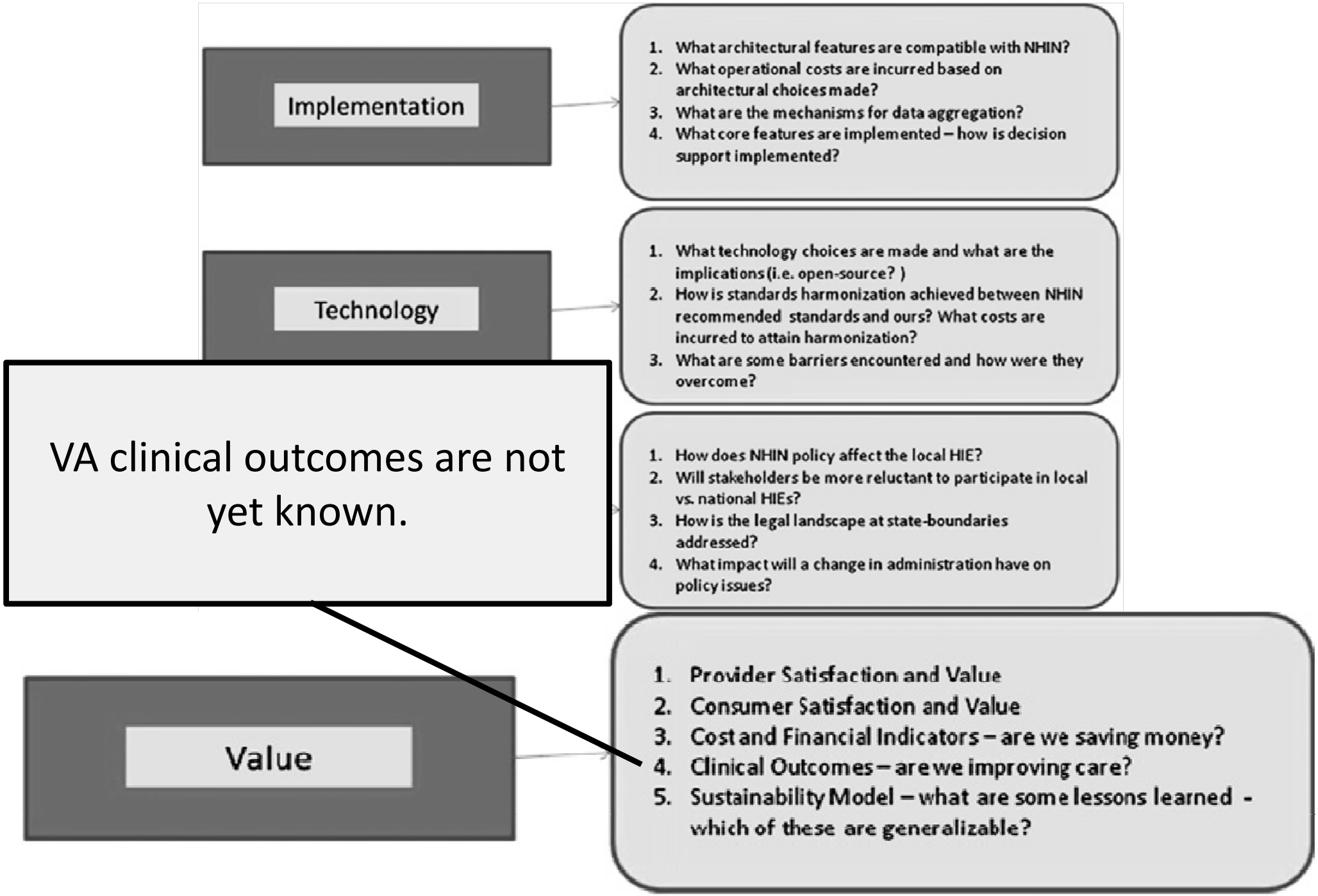
VA HSR&D Center of Excellence on Implementing Evidence-Based Practice
Richard L. Roudebush VA Medical Center
Indianapolis, Indiana

Evaluation framework



Dixon BE *et al.*, J Am Med Inform Assoc 2010; 17 (3):295-301.

Evaluation framework



Dixon BE *et al.*, J Am Med Inform Assoc 2010; 17 (3):295-301.

Randomized controlled trial of HIE among providers of care for HIV

Design: randomized at patient level

Setting: 6 infectious disease clinics paired with 9 ancillary community-based settings providing HIV case management

Participants: 254 patients with HIV

Intervention: HIE for 2 years/patient

Outcomes:

Medical records: HIV viral loads, CD4 counts, antiretroviral (ARV) prescriptions

Patient surveys (0, 12, 24 months): hospitalizations, emergency-department use, quality of life (Medical Outcomes Study SF-36)

Results: no statistically significant differences (ARVs slightly higher)

Limitation: small amount of info exchanged, no direct HIE access data

Proeschold-Bell RJ *et al.*, J Public Health Manag Pract 2010; 16 (6):521-8.

Early Randomized Controlled Trial in an Emergency Department (ED)

Design: randomized at patient level

Setting: large, longitudinal EHR system from an urban hospital to physicians at either of 2 emergency departments with large crossover

Participants: 16,374 intervention; 16,094 controls

Intervention: information to ED physician both as printed abstract & by means of online access to EHR system

Outcomes: charges, hospital admissions, repeat emergency visits, and emergency physicians' satisfaction with the information

Results: decreased charges by $26/encounter at one hospital, but no effect at the other hospital

- No differences in admission rates or repeat emergency visits
- Problem lists, medications most useful

Discussion: marked differences in workflows/information access across sites

Overhage JM *et al.*, Annals of Emergency Medicine. 2002; 39 (1):14-23.

Recent impact of HIE on emergency care

- Design: matched case-control study
- Setting: all major emergency departments (12) in Memphis, TN
- Participants: 15,798 HIE cases (12,120 patients)
  15,798 non-HIE controls (13,832 patients)
- Cases (exposures): emergency visits with HIE access (Aug 2007 to Aug 2008)
- Controls: emergency visits with no HIE access - matched by age, gender, race, care delivery site, discharge diagnostic code, primary payer
- Outcomes:
  - Hospital admissions from the emergency department
  - Admissions for observation
  - Laboratory testing
  - Head CT, body CT
  - Chest x-ray, ankle x-ray
  - Echocardiograms

Frisse *et al.*, *JAMIA*, 2012

Recent impact of HIE on emergency care

- *HIE data were accessed in 6.8% of emergency visits*
- **11 emergency departments directly accessed only HIE data via browser**
  - Decrease in hospital admissions
  - Increase in head CT and chest x-ray
- **12th emergency department relied more on printed summaries**:
  - Decrease in hospital admissions
  - Significant decreases in head CT, body CT, and lab tests
- **<u>Financial summary</u>**
  - HIE access was associated with annual cost savings of $1.9 million
  - Net of annual operating costs, HIE access reduced overall costs by $1.07 million
  - Hospital admission reductions accounted for 98% of cost reductions

Frisse ME *et al.*, J Am Med Inform Assoc 2012; 19 (3):328-33.

Lessons from empiric research

- Amount of information exchanged is important metric
- Access to transaction data improves strength of study design
- Mixed methods important to understand implementation
- Evidence suggests downward pressure on costs
  - Important to stakeholders
  - Quality important, too

HIE in emergency care: "who, what, and why"

- Mixed methods:
  - Cross-sectional audit log data
    - Overall usage trends
    - User logon statistics
    - Data types accessed by users
  - Semi-structured interviews
  - Direct observation in emergency departments actively using HIE
- Results:
  - Higher rates of access for (1) return visits, (2) sites for the underserved, (3) patients with high levels of comorbidity, (4) sites providing access to clerks, RNs, & MDs
  - Providers noted retrieving additional history (29%), preventing repeat tests (20%), comparing new to retrieved results (10%), avoiding hospitalizations (3%)

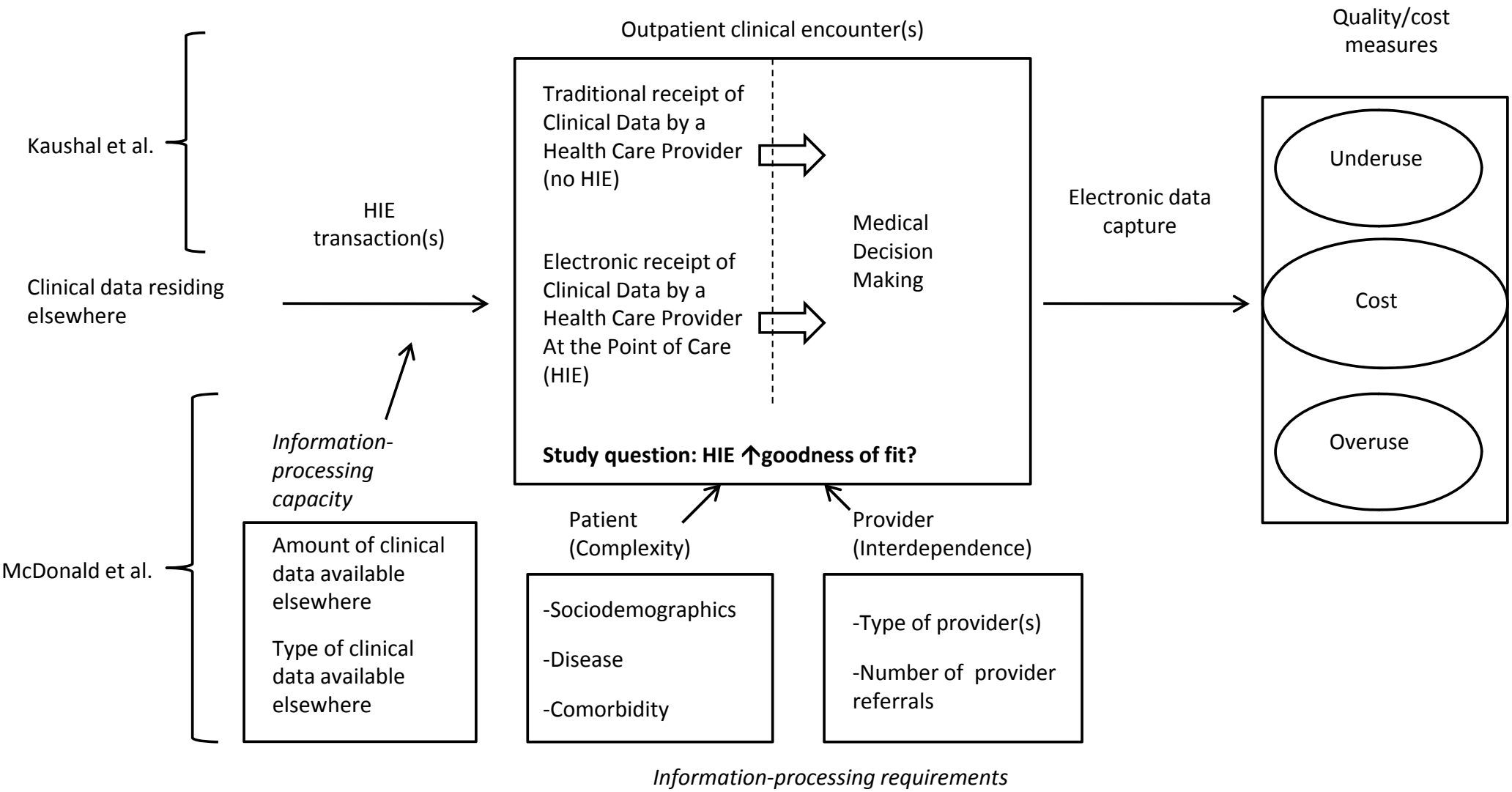
Johnson KB *et al.*, J Am Med Inform Assoc 2011; 18 (5):690-7.

"A Novel Set of Proposed Metrics for Electronic Quality Reporting"

- A literature review identified quality metric sets for ambulatory care
  - Ambulatory Care Quality Alliance (AQA)
  - National Quality Forum (NQF) ambulatory care measures
  - National Committee Quality Assurance (NCQA) Healthcare Effectiveness and Data Information Set (HEDIS) measures
- Two rounds of quantitative rating of individual metrics
- 36-member national expert panel validated rating process & final metric set
- Metrics were developed *de novo* to capture additional expected effects of EHR systems (reduced utilization)

Kern LM *et al.*, Jt Comm J Qual Patient Saf 2009; 35 (7):359-69.

Conceptual framework



Ambulatory measures of underuse

PREVENTION
Colorectal cancer screening up-to-date (age 50–80)
% of women 40–69 years of age who had a mammogram to **screen for breast cancer**
% of patients 50–64 years who received an influenza **vaccination**
% of patients 65 years and older who received an influenza **vaccination**
DIABETES
% of pts18–75 years of age with diabetes whose most recent **HbA1c** level during the measurement year is > 9.0%
% of pts 18–75 years of age with diabetes who had one or more **HbA1c lab tests** during the measurement yr
ASTHMA
% of patients 18–56 years of age who were identified as having persistent asthma and who were appropriately prescribed **medication** during the 12-month period
CARDIOVASCULAR DISEASE
% of patients w/**ischemic vascular disease** (**diagnosis**) who have documentation of use of **aspirin** or another antithrombotic during the 12-month measurement period (**medication**)
% of patients with ischemic vascular disease whose most recent **LDL-C** had a result of less than 100mg/dL
CONGESTIVE HEART FAILURE
% of patients with **CHF (diagnosis)** who also have paroxysmal or chronic **atrial fibrillation** who were prescribed **warfarin** therapy (**medication**)
MENTAL HEALTH
% of patients 18 years of age and older who had a **follow-up visit** within 30 days after being discharged for an inpatient mental health stay (including hospitalizations for depression, schizophrenia, attention deficit disorder, and personality disorders)
OSTEOPEROSIS
% of patients aged 50 years and older with fracture of the hip, spine, or distal radius who had a central dual-energy x-ray absorptiometry (**DXA**) measurement ordered or performed or pharmacologic therapy prescribed **(procedure**)

Kern LM *et al.*, Jt Comm J Qual Patient Saf 2009; 35 (7):359-69.

De novo metrics (including overuse)

Blood Tests How many tests were already completed for a patient that are less than [insert appropriate repeat interval] old at the time of the 2nd test? • Creatinine (10 days); Sodium (10 days) • Total cholesterol (6 weeks); HDL (6 weeks) ; Hemoglobin A1c (12 weeks) • Thyroid stimulating hormone (6 weeks); Liver function tests (ALT/AST) (6 weeks) • Hemoglobin (10 days); Ferritin (8 weeks)
Imaging Tests X-rays, ultrasounds, CT scans, and MRIs ordered over a 1-year period • how many represent tests for which results were already completed for that patient & are no more than 60 days old at the time of the 2nd test?
Cardiac Tests Stress tests, echocardiography, and cardiac catheterization ordered over a 1-year period • how many represent tests for which results were already completed for that patient & are no more than 90 days old at the time of the 2nd test?

- Other measure domains: discharge medication documentation, referrals, follow-up after discharge, ambulatory care sensitive hospitalizations, readmissions

Kern LM *et al.*, Jt Comm J Qual Patient Saf 2009; 35 (7):359-69.

Additional resources

Grant Final Report

Grant ID: R18HS017067

Developing and Using Valid Clinical Quality Metrics for HIT with HIE

Inclusive Dates: 10/01/07 – 03/31/11

Principal Investigator:
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Performing Organization:
Weill Cornell Medical College

Project Officer:
Steve Bernstein

Health Information Exchange Evaluation Toolkit

Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
540 Gaither Road
Rockville, MD 20850
www.ahrq.gov

Contract Number: 290-04-0016

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AHRQ Publication No. 08-0026-EF
November 2007

AHRQ
Agency for Healthcare Research and Quality
Advancing Excellence in Health Care • www.ahrq.gov
HEALTH IT

Conclusions about HIE research

- Conceptual frameworks can inform research consideration of…
  - Patient factors and provider factors
  - Information characteristics
  - Clinical decision-making role
- Both underuse & overuse of medical services potentially effected by HIE
- Need to consider impact of HIE in multiple settings
  - Emergency department
  - Ambulatory care/primary care
  - Specialty care
  - Inpatient care

Summary

- In the U.S., HIE has shown early signs of benefit for health care
- VLER is improving, expanding, and evaluating its HIE program
- Need to address technical issues, usability, patients' preferences, and sustainability
- Much research is needed!

Credits and thanks

- Tim Cromwell, Jamie Bennett
- Colene Byrne, Nelson Hsing, Lois Olinger, Elaine Hunolt, Eric Pan, Karl Banty, Nathan Botts, Lauren Mercincavage
- Omar Bouhaddou
- Brian Dixon
- Darrell Baker, Bryan Mitchell

Questions

- Questions now?

- Questions later?
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