

Communication in Informatics Workgroup Meeting July 11-12, 2012

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Workgroup Lead

CLIAC Meeting

August 29, 2012

Atlanta, Georgia

Outline

- ❑ Background
- ❑ Charge to Communication in Informatics Workgroup
- ❑ Workgroup Discussion Highlights
- ❑ Workgroup Suggestions
- ❑ Questions for CLIAC Consideration

Previous CLIAC Deliberations

- ❑ **At meetings since February 2010, CLIAC has focused on communication of laboratory testing information, especially as related to the implementation of electronic health records (EHRs)**
- ❑ **CLIAC - Recommendation September 2011: Implement a workgroup to outline the scope of issues related to communication of laboratory testing information and propose approaches to address these issues for discussion by CLIAC**
- ❑ **Focus for this meeting: What issues and strategies suggested by the workgroup does CLIAC see as critical for accurate and effective laboratory information system(LIS)/EHR communication?**

CDC Charge to Workgroup Participants

- ❑ **Provide individual input from your unique perspective and expertise to CDC on the challenges and opportunities associated with the ordering and interpretation of laboratory test results and related information in electronic health records for safe and effective interpretation in individual patient care decisions**

Workgroup Participants

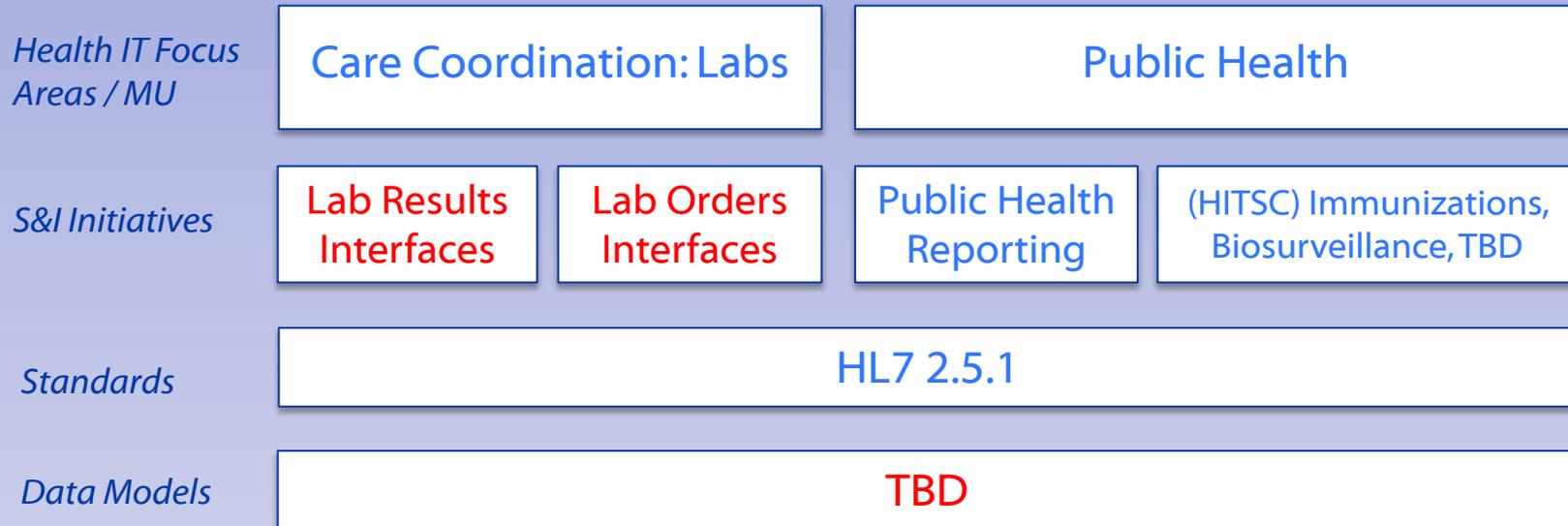
- ❑ John Fontanesi, PhD, Chair
- ❑ Adam Cheriff, MD
- ❑ Alexis B. Carter, MD
- ❑ Alvin Hoover, FACHE
- ❑ Anand Dighe, MD, PhD
- ❑ Brent Steineckert, MPH, PMP
- ❑ Cindy Johns, MSA, MT(ASCP),
MLS(ASCP)CMSHCM
- ❑ Elizabeth O. Johnson, BSN, RN, MS,
FHIMMS, CPHIMS
- ❑ Hardeep Singh, MD, MPH
- ❑ J. Mark Tuthill, MD
- ❑ Joanna C. Baker, MSPH, MT (ASCP)
- ❑ Jon M. Lipsky, MBA, PMP, CSM
- ❑ Joseph M. Campos, PhD, D(ABMM),
F(AAM)
- ❑ Michael S. Barr, MD, MBA, FACP
- ❑ Raymond D. Aller, MD, FACMI, FHIMSS
- ❑ Shaman Singh, MD
- ❑ Suzanne Butch, MA, MT(ASCP)SBB,
CQA(ASQ)
- ❑ Timothy J. Ryan, MBA
- ❑ Ulrike “Riki” Merrick, MPH
- ❑ Walter Henricks, MD

The Background:

Examples of ONC Standards and Interoperability Initiatives

Initiative (chronological)	Value Created
Transitions of Care	Defines standardized content that enables electronic exchange of core clinical information among providers, patients, and other authorized entities to improve coordination of patient care
Laboratory Results Interface	Standardizes results reporting to ambulatory primary care, in support of Meaningful Use objectives for decision support, quality reporting, and transitions in care
Provider Directories	Provides a scalable, standardized solution to discover digital certificates, and an extensible model to query for electronic service information to facilitate health information exchange
Certificate Interoperability	Enables providers to electronically exchange and protect electronic health information created or maintained by certified EHR technology
Query Health	Focuses on establishing standards for distributed queries, which can increase the ability to understand macro health trends, proactively respond to disease outbreaks, understand the efficacy of drug treatments, and contribute to reduction of healthcare costs
Data Segmentation for Privacy	Enables the implementation and management of electronic health information exchange disclosure policies allowing providers to share specific portions of an electronic medical record
Electronic Submission of Medical Documentation	Gives CMS and other relevant Payers the ability to send electronic medical document requests, and investigates options to replace providers' wet signatures with an electronic equivalent
Public Health Reporting	Enabling a standardized approach to electronic public health reporting from EHR systems to local, state and federal public health programs
Longitudinal Coordination of Care	Enables care coordination across long-term, post-acute and other non-hospital settings. Builds on existing work, including S&I Transitions of Care initiative

ONC Initiatives: Labs and Public Health



Discussion Highlights

- ❑ **Identified causes of Communication error**
- ❑ **Recommended Solutions for Communication Errors**
- ❑ **Used Sociotechnology model** (Dean F Sittig and Hardeep Singh, *Qual Saf Health Care* 2010 19:i68-i74) as a framework to describe causes and solutions
 - A model for studying health information technology in complex adaptive healthcare systems
 - Example

Classes and Examples of Communication Error...

❑ Transmission Errors

- LIS-EMR interface eliminated first 35 characters of transmitted reports and changed
 - “no evidence of abnormality” to “evidence of abnormality”
- < to >
- Adjusted INR ratio by 8%

❑ History Tracking Errors

- Overwrote “preliminary” Lab results when “final” results available

Classes and Examples of Communication Error... (yep more)

❑ Order Set Logic Errors

- Changed specimen type to last specimen type order
- Eliminated order when multiple types at multiple locations ordered

Example of Overwrite: If the Potassium and ABG are both selected, then the arterial blood specimen type is overwritten by blood specimen type.

Chargetest, Yikes #1913184-6 - Collect Specimen

Please provide the following information:

Specimen Type: Blood

Specimen Src:

Lab: Collection Date: Collection Time:

Collections

- POTASSIUM, BLOOD** - Scheduled for Mon Mar 5, 2012 11:30 AM
Ordered: Routine, On Mon 3/5/12 at 1130
Tube: Green Plasma Separator Tube
- ABG PANEL, ARTERIAL** - Scheduled for Mon Mar 5, 2012 11:30 AM
Ordered: Routine, On Mon 3/5/12 at 1130
Tube: Hep Plastic Syringe
Write Pt Temp and FIO2/Flow on the requisition in the area provided.

11

Accept Cancel

Example of Order Elimination : When multiple types of studies ordered (e.g. radiology and CBC's) if studies NOT performed at the same location then the last order is eliminated

Place orders (Enc Date: 8/19/2011) - Wt: (Not entered for this visit) Ht: (Not entered for this visit) ? Resize

Association Pref List Interactions Pharmacy Providers Routing CC Results Open Orders Pend Orders Sign Orders Financial Link Order

New order: Search

New order defaults Not using defaults

Facility Orders Medications (1 Order)

penicillin G benzathine (BICILLIN-LA) IM injection 2.4 Million Units

2.4 Million Units, Intramuscular, ONCE, 1 dose Today at 1045

F7- Prev Order F8- Next Order

Database Search - Chargetest,Apple

Search

Facility Orders Ambulatory Orders/Prescriptions

Procedures (Facility Orders Medication selection from the Database has been disabled)

Code	Name
7003	CBC WITH ADIFF, BLOOD
7002	CBC (aka HEMOGRAM, BLOOD)

Classes and Examples of Communication Error... (almost there)

□ Notification Errors

- Critical Values triggered but not transmitted
- Lab Results sent to ordering-but not treating physician

□ Workflow Errors

- Assumes Physician both orders and signs – usually the MA or RN who orders

Classes and Examples of Communication Error... (Finally)

□ Interface Design Errors

- Lab Order Discontinuation required identifying order, discontinuing then confirm discontinuation-*except* that “button” is on a separate “page”
- Lab results dispersed over multiple “pages” but not indicated as such
- “Busyness” of screen obfuscates information

DOB: 06/16/1935
76 year old, Male
PCP: Gamble, Paul Northam, MD
Allergies: Sulfa Drugs
Coverage: MEDICARE
MyUCSDChart: Pending

Order Review - Lab Orders

Refresh Views Filter Association Discontinue Release Extend Select Orders Accept Orders

Order	Remaining	Standing Int	Last Perform	Exp Col Date/Time	Approx	Expires	Order Date	Authorizing Provider
HEMOGRAM, BLOOD							10/25/2011 1534	Flores, Eleanor Anita, NP
COMPREHENSIVE METABOLI...							10/25/2011 1534	Flores, Eleanor Anita, NP
HEMOGRAM, BLOOD							10/25/2011 1534	Flores, Eleanor Anita, NP
COMPREHENSIVE METABOLI...							10/25/2011 1534	Flores, Eleanor Anita, NP
LAB MISC TEST							4/24/2012 1653	Castro, Januario Enrique, MD
PSA (DIAGNOSTIC), BLOOD	1/1			~ 08/03/2012	Yes [1]	8/3/2012 2359	5/3/2012 1159	Schmidt, Joseph David, MD
COMPREHENSIVE METABOLI...	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
LIPID(CHOL FRACT) PANEL B...	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
GLYCOSYLATED HGB(A1C), B...	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
TSH, BLOOD	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
URINALYSIS	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
CBC WITH ADIFF, BLOOD	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
PSA (SCREEN), BLOOD	1/1					8/3/2012 2359	5/3/2012 1410	Gamble, Paul Northam, MD
COMPREHENSIVE METABOLI...				06/04/2012			6/4/2012 1434	Gamble, Paul Northam, MD
URINALYSIS				06/04/2012			6/4/2012 1434	Gamble, Paul Northam, MD
URINE CULTURE				06/04/2012			6/4/2012 1434	Gamble, Paul Northam, MD
CBC WITH ADIFF, BLOOD				06/04/2012			6/4/2012 1434	Gamble, Paul Northam, MD

Default IP ORDER REPORT (RICH TEXT)

Report: Default

Order CBC WITH ADIFF, BLOOD [7003] (Order 48352308)

Patient Information

Patient Name: [Redacted] Sex: Male DOB AGE: 6/16/1935 (76 year old)

Patient Number: 35682152

Order Information

Date and Time: 6/4/2012 2:42 PM Released By: Collins, Jerry L., RN
Authorizing: Gamble, Paul Northam, MD Department: Lim Internal Medicine

Order Providers

Authorizing Provider: (03430) Gamble, Paul Northam, MD
Encounter Provider: (03430) Gamble, Paul Northam, MD

Collection Date/Time: _____ / _____
Phlebotomist Initials: _____

Priority and Order Details

Priority: Routine
Order Status: Sent
Class: Clinic Lab Collect

Start Date/Time

Start Date: 06/04/12

Order Questions

Question: Tube Top Color
Answer: Lavender

Specimen Information

Type: Blood

DOB: 06/16/1935
 76 year old, Male
 PCP: Gamble, Paul Northam, MD
 Allergies: Sulfa Drugs
 Coverage: MEDICARE
 MyUCSDChart: Pending

Order Review - Lab Orders

Order	Remaining	Standing Int	Last Perform	Exp Col Date/Time	Approx	Expires	Order Date	Authorizing Provider
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CBC WITH ADIFF, BLOOD				06/04/2012			6/4/2012 1434	Gamble, Paul Northam, MD

Same Tests
 Reordered Because
 Providers Can't tell if
 Completed

Default IP ORDER REPORT (RICH TEXT) Report: Default

Order CBC WITH ADIFF, BLOOD [7003] (Order 48352308) Collection Date/Time: _____ / _____ / _____
 Phlebotomist Initials: _____

Patient Information

Patient Name: [REDACTED] Sex: Male DOB AGE: 6/16/1935 (76 year old)

Priority and Order Details

Priority: Routine
 Order Status: Sent
 Class: Clinic Lab Collect

Start Date/Time

Start Date: 06/04/12

Order Information

Date and Time: 6/4/2012 2:42 PM
 Authorizing: Gamble, Paul Northam, MD
 Department: Lim Internal Medicine

Order Providers

Authorizing Provider: (03430) Gamble, Paul Northam, MD
 Encounter Provider: (03430) Gamble, Paul Northam, MD

Order Questions

Question: Tube Top Color
 Answer: Lavender

Specimen Information

Type: Blood

Possible Solutions

- ❑ **THINK OF THE LABORATORIAN AS PART OF THE TREATMENT TEAM**
- ❑ **Use distributed cognition to understand the workflow of clinical operations and design EMR to “fit”**
- ❑ **Use learning theory to create Decision Support Tools**
- ❑ **Use design principles to create the user interface**
- ❑ **Support NIST Usability Measurement Standards**

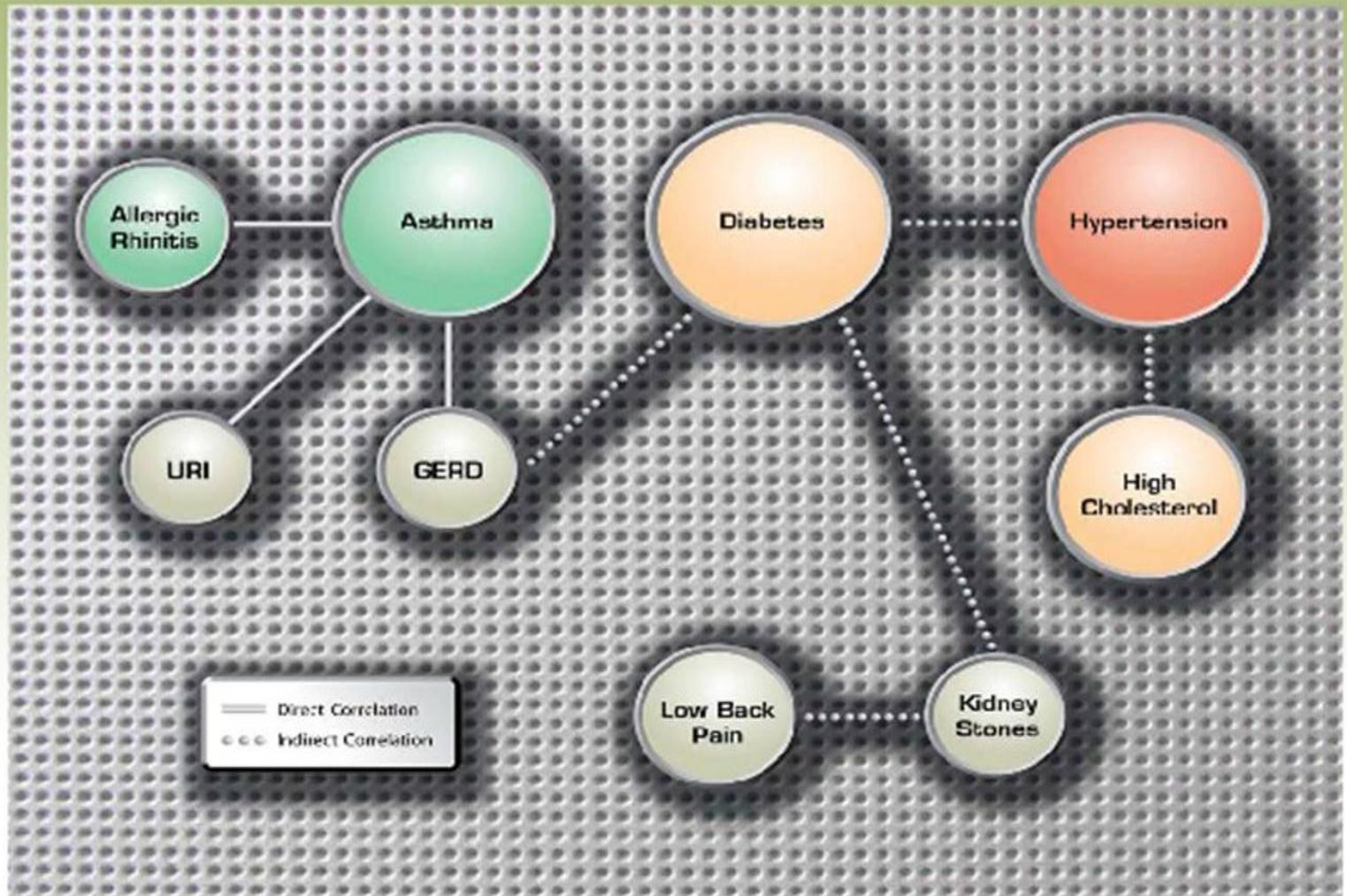
Design Principle Examples: Current State

Problem List: Current View

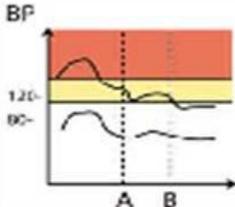
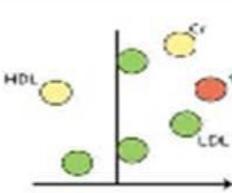
Classification View Active Problems

Annotated Display	Name of Problem	Code		Life Cycle Date	Course
<input type="checkbox"/> All Problems					
ECHO Doppler (2/01...	AORTIC VALVE DISORDE...	424.1		10/30/2003	Stable
Glaucoma, sees NM...	GLAUCOMA	365		8/11/2003	Stable
BPH	HYPERTROPHY (BENIGN...	600.0		9/29/2003	Stable
Asbestos exposure: ...	NONSPECIFIC ABNORMA...	793.1		2/23/2005	
High LDL, Low HDL	Pure hypercholesterolemia	272.0		9/29/2003	Stable
DM- type 2	type II diabetes mellitus (no...	250.00		8/7/2003	Stable
HYPERTENSION	UNSPECIFIED ESSENTIA...	401.9		8/25/2004	

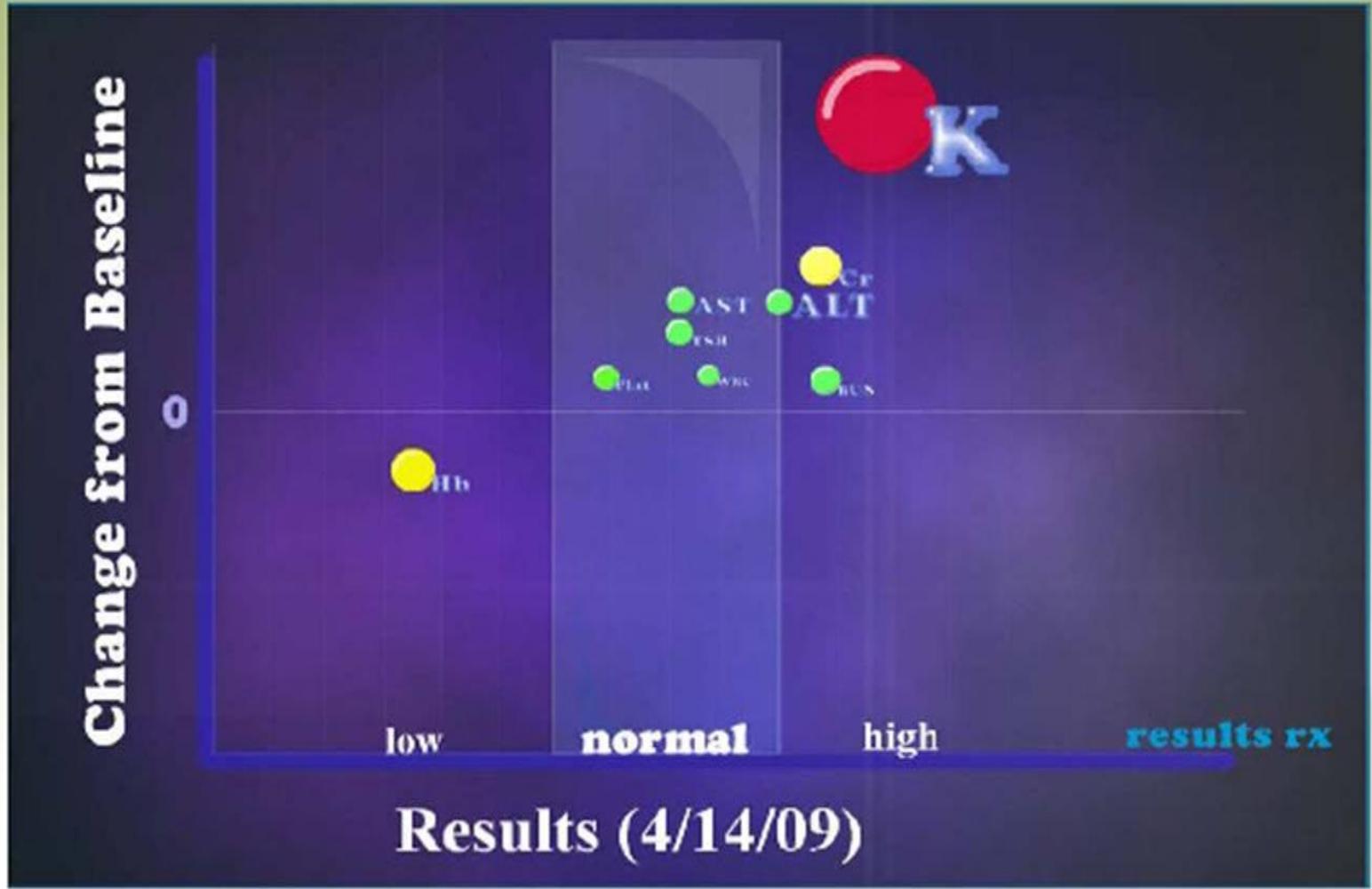
Design Principle Examples: Future State



Design Principle Examples: Current State

Hypertension	Diabetes	Cholesterol	Asthma
<p>Dx: 2004 Goal BP: < 120/80</p> <p>BP in Past Year Avg: 128/86 Best: 114/78 (2/17/09) Worse: 144/88 (7/21/08)</p> <p>Complications -None</p>	<p>BP Meds (A) Norvasc 10mg (started 5mg in 1/17/08, increased to 10mg 7/4/08, last refilled 1/12/09) (B) Cozaar 100mg (started 100mg 9/21/08, last refilled 1/12/09)</p> <p>Failed Meds -Diazide: poor control -ACE: Cough</p>	<p>Vitals</p> 	<p>Labs</p> 
<p>Past Studies</p> <ul style="list-style-type: none"> ECG (11/17/2003): WNL ECHO (2/04/2008): Normal Size and Function, Mild MVP, mild MR ECG (5/22/2007): Normal Function, mild CLVI, Mild MVP, mild MR 			
<p>Past History (Summary of Visits)</p> <ul style="list-style-type: none"> 1/12/2009 (WebVisit): Felt fine, refilled meds 9/21/2008 (Office): Felt fine, added Cozaar 100mg 7/7/2008 (Office): Mild Headache, increased Norvasc from 5 to 10mg 			
<p>Relevant Physical Exam</p> <p>BP: 138/86 Pulse: 78 Weight: 212lbs BMI: 31.2 Heart: Normal Abnormal: RRR, 2/6 SEM Lung: Normal Abnormal: LE Edema: None Present:</p>			
<p>History and Plan [x] Visit [] Phone [] Web [] Other</p> <p>RED FLAG <input type="radio"/> K = 5.8 (4/3/09)</p> <p>HISTORY</p> <ul style="list-style-type: none"> Symptoms: Denies chest pain, Dyspnea, Edema, Dizziness Other: Home BP Range: Normal High Low Details: 130s/80s <p>PLAN</p> <ul style="list-style-type: none"> PATIENT ED: None Diet Exercise HomeBP MEDS: No Change Change Meds: Add HCTZ 25mg LABS: SMA UA Other STUDIES: None ECG Other: REFERRALS: None Refer: RTC: 1 Month 3 Months 5 Months Others 			
<p>Today's Appointment: 4/3/09 (Friday) at 2pm</p> <p>Last Appointment: 1/12/2009 (Web)</p> <p>Next Appointment: Not scheduled</p> <p>Allergies: Penicillin</p> <p>Meds: Cozaar 100mg (1 daily PO) Norvasc 10mg (1 daily PO) Zocor 20mg (1 daily PO) Metformin 500mg (1 BID) Advair 250 (1 puff BID)</p>			
<p>Home</p>			

Design Principle Examples: Future State



Workgroup Suggestions

- **Multipronged strategies needed:**
 - Secure Laboratory Community representation on either one or both Office of the National Coordinator (ONC) Advisory Committees
 - Ensure laboratory community position and concerns are included in ONC's action and surveillance plan for safety in the EHR
 - Response to Institute of Medicine due November 2012
 - Engage more laboratorians in national and state information technology workgroups
 - ONC tiger teams and S and I workgroups
 - Certification and Standards development both for software and professionals
 - NHIN direct project

Workgroup Suggestions (cont.)

□ Multipronged Strategies (cont.)

- Raise awareness to LIS/EHR communication issues emphasizing patient safety and ensuring more centered on patient
 - Lab Community
 - Stakeholders
 - Consumers
 - Vendors
- Publish white paper
- Improve and expand laboratory professionals' IT education both in formal and informal settings
- Convene meeting of private and public sector to discuss and resolve LIS/EHR Communication issues

Questions for CLIAC Consideration

- ❑ **What issues identified by the workgroup are critical for accurate communication of laboratory testing information, especially with respect to electronic health records (EHRs)?**
- ❑ **What are feasible strategies to address these issues?**
- ❑ **What strategies would be most effective to facilitate HHS moving forward, to assure patient safety with respect to laboratory testing information in EHRs?**