Reducing Diagnostic Errors

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Excellent Laboratories, Outstanding Health

Division of Laboratory Systems

CDC Division of Laboratory Systems

Vision
Exemplary laboratory science and practice across clinical care and population health

Mission
Strengthen the nation's clinical and public health laboratory system by continually improving quality and safety, informatics and data science, and workforce competency

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Our Stakeholders

260,000 LABORATORIES IN USA

Lab Personnel **800,000**

CMS Quality Improvement Evaluation System

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Volume and Significance of Laboratory Testing

13.8 BILLION tests per year — That's over 42 tests per year for every person living in the United States

70% of today's medical decisions *depend on laboratory test results*

Beastall, GH. Adding value to clinical biochemistry. Ann Clin Biochem 2010;47(Suppl 1):1.

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Reducing Diagnostic Error

System Solutions

Multidisciplinary Medical Management Teams

Enhance Laboratory Workforce

Empower Patient Engagement

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This is a Big Problem

- 40,000 – 80,000 deaths (autopsy data) or 5 to 9 per hour
- 1 in 10 diagnoses are wrong (secret shoppers)
- 1 in 3 people surveyed have experienced a dx error (survey)
- Most common cause for a malpractice claim
- **1 in 20 patients will experience a diagnostic error every year (chart review)**

IOM: Improving Diagnosis in Health Care, Mark Grabber CLIAC, November 2015:
https://ftp.cdc.gov/pub/CLIAC_meeting_presentations/pdf/CLIAC_Summary/cliac1115_summary.pdf

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Systems Solution for Electronic Health Data

'Fit for Purpose'
Data must be complete, consistent, accurate, and *contain all critical data elements* needed to evaluate a medical device and its claims.

Systemic Harmonization and Interoperability Enhancement for Laboratory Data

△ SHIELD™

LOINC®
from Regenstrief

SNOMED International

Unified Code Units and Measure

ACCESS GUDID
IDENTIFY YOUR MEDICAL DEVICE

- Multiagency task force to harmonize systems reporting of laboratory test result codes
- FDA published the "Logical Observation Identifiers Names and Codes for In Vitro Diagnostic Test" to encourage instrument manufacturers to provide LOINC® codes for their tests
- **IVD Industry Connectivity Consortium (IICC)** provided a digital format to provide the codes to laboratories http://ivdconnectivity.org/livd/
- Pilots for proof of concept

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Life Without Harmonization and Interoperability

Code Used	Display Name
496	Hemoglobin A1c
L33431	HbA1c
0070426	Hemoglobin A1c
001453	Hemoglobin (Hb) A1c, blood
005223	Hemoglobin A1c
HBA1C	Hemoglobin (Hb) A1c. Blood
83036	Hemoglobin A1c (HbA1c)
C145	Hemoglobin A1c
4548-1	Hemoglobin A1c

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Life with Harmonization and Interoperability

△ SHIELD™

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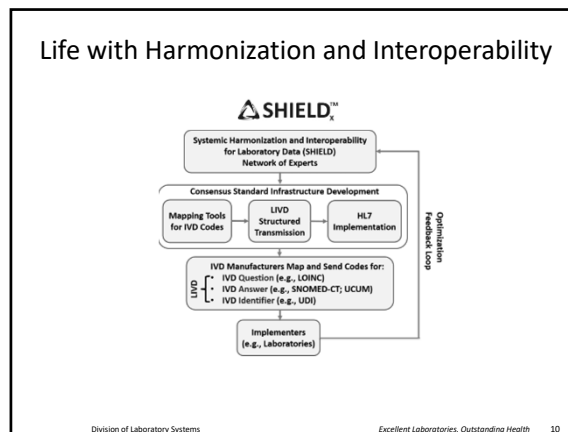
Benefits of Using SHIELD Approach

- Reduce the mapping burden for laboratories
- Reduce the amount of time needed to interpret and import laboratory data into other systems
- Improve data quality for surveillance activities, outbreaks and patient care
- Reduce adverse events
- Improving clinical decision support
- Reduce financial burden on the healthcare ecosystem.

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Clinical Laboratory Integration into Healthcare Collaborative (CLIHC)

Clinical decision support tools

- **Evaluation of partial thromboplastin time (*PTT) Advisor* mobile application accepted for publication in *Journal of the American Medical Informatics Association***
  - Contribute to better clinical laboratory test ordering and diagnosis and serve as a learning tool for diagnostic evaluation of certain bleeding and coagulation disorders.

pilots for LIVD format

- ***Anticoagulation Manager* mobile application**
  - Resource for clinicians to appropriately order laboratory testing and choose anticoagulant drugs and dosage for patients
  - Publication in the app store coming soon

PTT CDC

ANTICOAG MANAGER CDC

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Diagnostic Safety and Improvement

- **Diagnostic Management Team (DMT) evaluation**
  - o Conduct an evaluation that will compare DMT-based diagnostic decision making and traditional, clinician-based decision-making

- **Agency for Healthcare Research and Quality (AHRQ) Initiative**
  - o Establish a cross-agency research agenda for diagnostic safety and improvement

IMPROVING DIAGNOSIS IN HEALTH CARE

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CDC Laboratory Training

- **In FY2017**
  - 34 publicly available eLearning courses
  - 84 in-person workshops

- Join the **Laboratory Training Group** in CDC TRAIN

http://www.cdc.gov/labtraining

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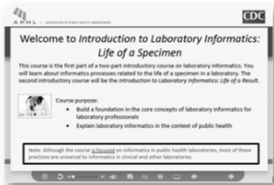
Ready? Set? Test! Online Course

- Course is available free on CDC TRAIN and offers free CE
- Knowledge check questions throughout the course to reinforce learning
- Templates, checklists, resources to save/download
- Scenarios – nursing home, hospital, doctor's office
- www.train.org/cdctrain/course/1056331

READY?   SET?   TEST!
Patient Testing is Important
GET THE RIGHT RESULTS
CDC Centers for Disease Control and Prevention

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Laboratory Informatics Training

Welcome to *Introduction to Laboratory Informatics: Life of a Specimen*

- Development of eLearning modules
- Trainings outline informatics capabilities, standards, and terminology that apply to both public health and clinical laboratories

- 3 Courses to be released in 2018:
  - o Introduction to Laboratory Informatics: Life of a Specimen (July)
  - o Introduction to Laboratory Informatics: Life of a Result (July)
  - o Introduction to LIMS and Other Information Systems (Dec)

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Workforce Assessment of Laboratory Communities (WALC)

New Initiative!

Objectives:

1) Identify the critical training and workforce development needs in the public health laboratory and clinical laboratory communities
2) Generate feedback on DLS resources, including *Laboratory Competency Guidelines* uptake and application
3) Collaborate with partners to prioritize and address needs in laboratory training and workforce development

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Data for Action

1) Identify the critical training and workforce development needs in the public health laboratory and clinical laboratory communities (Years 1-2)

   - Literature review (Year 1)
   - Identify themes and gaps in data (Year 1)
   - Work with clinical partners to fill gaps in data (Year 2) (what priority questions have little or no recent data available?)

2) Generate feedback on DLS resources (Years 1-2)

3) Collaborate with partners to prioritize and address needs (Year 3)

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Summary

- A focus of DLS is Reducing Diagnostic Errors
  - SHIELD is systems based informatics approach
  - Evaluation of Multidisciplinary Medical Management Teams
  - Enhancing laboratory workforce
- Our approach is a work in progress

Disclaimer

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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