

*“Linking Clinical Data to  
Administrative Data”  
AHRQ Contract with MHA*



## Data Collection & Transmission

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January 15, 2008



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**CardinalHealth**  
*Essential to care™*

# Data Collection & Transmission

- Data Sources
- Classifications
- Data Merging/Linkage
- Data Editing and Validation
- Data Systems Survey

# Data Sources

- UB04
  - Provides patient demographic, admission and diagnostic/procedure data
  - Includes new Present on Admission indicator for diagnosis codes
- Laboratory Results
  - Date, time, test ID, results for selected blood gas, chemistry and hematology tests
  - HL7 format preferable

# Example Lab Test – HL7

**PID**|1||**M000279793**^^^MS4ADT010^MR||DOE^JOAN||198601010000|F|||||||||**V00000303073**^^^MS4ADT010|  
**ORC**|RE|001075244^LA01|001075244^LA01|R010151516^LA01|CM||1^^^200701012314^^S||200701012315||||MAI  
N||  
**OBR**|1|001075244^LA01|001075244^LA01|0232132^CBC WITH  
DIFF^LAB^0232132^^LA01|S||**200701012314**||||ER||||  
**OBX**|1|NM|**WBC**^WHITE BLOOD CELL^LA01|1|**15.6**|10^9/L^10^9/L|**4.2-10.2**|H||||F||N|200701012329|||

- Billing Number           V00000303073
- MRN                       M000279793
- Date Collected         20070101
- Time Collected         2314
- Test ID                  WBC
- Result                   15.6
- Ref Range                4.2-10.2

# Classifications/Coding

- UB04 – UB standard codes for point of origin, discharge status
- UB04 – ICD-9-CM for diagnosis and procedures
- Laboratory – Logical Observation Identifiers Names and Codes (LOINC®)
  - Created and maintained by Regenstrief Institute
  - In public domain
  - Assign unique code for test, method, unit of measure
  - Requires mapping with hospital test ID unless hospital is already using the LOINC® codes in their laboratory system
  - HL7 provides mechanism to send and identify hospital specific and/or universal codes in their file structure

# LOINC® Examples

- Blood Gas

pCO2 Arterial (mmHg) 2019-8

PCO2 Venous (mmHg) 2021-4

- Chemistry

Calcium Serum (mg/dL) 17861-6

Calcium Serum (mEq/L) 2000-8

Protein Serum (g/dL) 2885-2

Protein Serum (g/L) 2885-2

- Hematology

Hematocrit (%) 20570-8

WBC ( $10^9/L$ ) 26464-8

WBC (mm<sup>3</sup>) 26464-8

# Selection of Laboratory Tests

- Identify those that meet needs of the project
  - Focus on common tests that have few issue regarding interpretation and provide important information on patient risk
  - Marginal cost of adding new tests is relatively small
  - Evaluate needs of project for culture results data and ability to easily capture from various systems
- Work with LOINC® developers for any issues requiring modification or addition of codes

# Data Merging/Linkage

- Linkage of UB 04 and Laboratory Results
  - Requires sufficient identifying information in both systems for both patient and specific admission
- Linkage Options
  - At hospital site prior to transmission
  - After transmission to host system
- Data merging will create unified database for analysis

# Linkage Issues

- Format of patient identifiers between systems
- Use of patient account numbers for laboratory tests done in ED or prior to admission
- Unmatched data between systems (e.g. UB record but no laboratory data) will need to be evaluated to determine completeness of record or problems with matching process

# Data Editing and Validation

- Screen for inconsistent and implausible data elements
  - Individual record issues
  - Frequency/trend inconsistencies
  - Use laboratory data where possible to assist in screening (diagnosis codes versus laboratory values)
- Correct errors where possible and flag questionable data where correction not feasible
- Document methods to develop protocols for sharing with other partners

# Data Systems Survey

- Develop survey to address key elements for data collection and transmission
- Data systems (vendors, versions)
- HL7 capabilities
- IT support
- Availability of data elements (e.g. POA indicator for non-Medicare cases)
- Availability of LOINC® codes for laboratory data