“Using Clinically-Enhanced Claims Data to Guide Treatment of Acute Heart Failure”
An AHRQ Grant to MHA

Data Acquisition & Transmission
Laboratory Data
Databases for Outcomes Assessment

- Manual
  - Other Clinical Data
  - Vital Signs
  - Numerical Laboratory
  - Present-on-Admission
  - Standard Claims

Automated

Clinically-Enhanced Claims Data
## Efficient Use of Clinical Data

<table>
<thead>
<tr>
<th>Analytic Power</th>
<th>Cost to Collect</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>POA Codes, Albumin</td>
<td>Glasgow Coma Score</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>FEV1</td>
</tr>
</tbody>
</table>
Risk-adjustment using numerical lab data

- Results of 22 lab tests enter at least 1 of 12 models
- Results of 14 tests enter 4 or more of 12 models

- pH (11)
- Prothrombin Time (10)
- Sodium (9)
- White Blood Count (9)
- Blood Urea Nitrogen (8)
- pO₂ (8)
- Potassium (7)

- SGOT (7)
- Platelet Count (7)
- Albumin (5)
- pCO₂ (4)
- Glucose (4)
- Creatinine (4)
- CPK-MB (4)
Chemistry Data

- Albumin
- Alkaline phosphatase
- Amylase
- Aspartate aminotransferase
- Bicarbonate
- Bilirubin (total)
- B-type natriuretic peptide
- Calcium
- Creatine Kinase
- Creatine Kinase MB
- Creatinine
- Glucose
- Lactate Dehydrogenase
- Potassium
- Sodium
- Troponin I
- Troponin T
- Urea Nitrogen
<table>
<thead>
<tr>
<th>Blood Gas</th>
<th>Hematology</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Arterial O₂ saturation</td>
<td>• Hemoglobin</td>
</tr>
<tr>
<td>• Arterial pCO₂</td>
<td>• International normalized ratio</td>
</tr>
<tr>
<td>• Arterial pH</td>
<td>• Neutrophil bands</td>
</tr>
<tr>
<td>• Arterial pO₂</td>
<td>• Partial thromboplastin time</td>
</tr>
<tr>
<td>• Base excess (deficit)</td>
<td>• Platelet count</td>
</tr>
<tr>
<td>• Bicarbonate</td>
<td>• Prothrombin time</td>
</tr>
<tr>
<td>• FIO₂ (if electronic)</td>
<td>• White blood count</td>
</tr>
</tbody>
</table>

Blood Gas & Hematology Data
# Examples of LOINC Coding

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Specimen Type</th>
<th>Units</th>
<th>LOINC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>Serum/Plasma</td>
<td>g/dL</td>
<td>1751-7</td>
</tr>
<tr>
<td>pCO₂ Arterial</td>
<td>Arterial Blood</td>
<td>mmHg</td>
<td>2019-8</td>
</tr>
<tr>
<td>Calcium</td>
<td>Serum/Plasma</td>
<td>mg/dL</td>
<td>17861-6</td>
</tr>
<tr>
<td>Calcium</td>
<td>Serum/Plasma</td>
<td>mEq/L, mmol/L</td>
<td>2000-8</td>
</tr>
<tr>
<td>Calcium</td>
<td>Whole Blood</td>
<td>mg/dL</td>
<td>49765-1</td>
</tr>
<tr>
<td>Calcium</td>
<td>Whole Blood</td>
<td>mEq/L, mmol/L</td>
<td>1996-8</td>
</tr>
</tbody>
</table>
## Transmission Format: Data Elements

1. Provider Number  
2. Admission Date  
3. Discharge Date  
4. Date of Birth  
5. Patient Sex  
6. Medical Record Number  
7. Patient Account Number  
8. Social Security Number  
9. LOINC Code  
10. Observation Units  
11. Observation Range  
12. Observation Value  
13. Observation Date/Time  
14. Analysis Date/Time  
15. Comments
### Transmission Format: Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Sequence #</td>
<td>2</td>
</tr>
<tr>
<td>Data Element</td>
<td>Admission Date</td>
</tr>
<tr>
<td>Name</td>
<td>ADATE</td>
</tr>
<tr>
<td>Field Format</td>
<td>PIC9(8)</td>
</tr>
<tr>
<td>Field Length</td>
<td>8</td>
</tr>
<tr>
<td>Position From</td>
<td>13</td>
</tr>
<tr>
<td>Position Through</td>
<td>20</td>
</tr>
<tr>
<td>Value Format</td>
<td>Date in MMDDYYYY format</td>
</tr>
<tr>
<td>Comments</td>
<td></td>
</tr>
</tbody>
</table>
Rules for Lab Data Transmission

• Cases for which data are required may be identified by
  – principal diagnosis
  – procedure
  – age group

• Each row will contain information about a single lab test on a single patient

• Data will be limited to
  – specified time periods (e.g., from 30 days prior to admission until discharge)
  – specified laboratory tests
Preparation for Submission of Lab Data

• Participating hospitals will
  – map their electronic data into the standardized flat file format using tools supplied by the project team
  – submit completed data maps for review by the project team

• Project team will
  – Supply standardized materials to support data mapping by participating hospitals
  – assist individual hospitals in preparing their data maps
  – review completed maps for completeness and accuracy
  – provide feedback and assistance as needed
Transmission & Analysis of Lab Data

- Hospitals will submit a test samples of lab data to the project team
- Project team will analyze test data and work with individual hospitals to ensure completeness and accuracy of data submission
- Hospitals will submit lab data periodically
- Project team will work with individual hospitals to ensure completeness and accuracy of data
- Project team will merge and analyze data
- Project team will report analytic findings to hospitals