Health Domain Panel Challenge Problems

- Precision phenotyping
- Right set of drugs 1st time

William W. Stead, M.D.
Chief Strategy Officer
McKesson Foundation Professor of Biomedical Informatics & Medicine
Vanderbilt University Medical Center
Finding a “simple” phenotype: Who has hypertension?
Definition: SBP > 140 or DBP > 90

- Patient 1: Doesn’t have hypertension
- Patient 2: Has hypertension
A “simple” example: Hypertension
Multiple components are better
(and blood pressure is the worst)
The Future: Meet Augustus Jones – “People Like Me”
“People Like Me”

Secure Personal Social Network Life Portal

Analytic Engine

Electronic Health Record

200 Close Matches
Potential diseases
Response to therapies
Outcomes
Availability of trials
Drug Prescribing & Adherence Cycle

1-Choose
2-Formulate
3-Write or transmit
4-Clarify
5-Dispense
6-File claim
7-Take
8-Monitor
9-Refill
Magnitude of failure to achieve adherence (Steps 4-8)

- Approximately 50% of patients do not take medications as prescribed
- 33%-69% of medication-related hospital admissions are due to poor adherence – cost $100B/year

Drug Prescribing & Adherence Cycle
# Learning System Approach

<table>
<thead>
<tr>
<th>Learning System</th>
<th>Research Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respond to individual &amp; family goals</td>
<td>• Elicit goals</td>
</tr>
<tr>
<td></td>
<td>• Support shared decision making</td>
</tr>
<tr>
<td>Solve for a coordinated set of interventions</td>
<td>• Detect phenotype signatures</td>
</tr>
<tr>
<td></td>
<td>• Detect sets of interventions</td>
</tr>
<tr>
<td></td>
<td>• Detect patterns of response</td>
</tr>
<tr>
<td>Start small, monitor and adjust the “cycle” as a whole</td>
<td>• Sense &amp; log inputs (actors &amp; actions)</td>
</tr>
<tr>
<td></td>
<td>• Deliver context sensitive predictive nudges</td>
</tr>
<tr>
<td></td>
<td>• Assay spectrum of biomarkers</td>
</tr>
<tr>
<td></td>
<td>• Track functional outcomes</td>
</tr>
</tbody>
</table>