Leveraging Predictive Modeling Across the Care Continuum to Address Current Economic Initiatives

The Third National Predictive Modeling Summit
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About MEDai

• Subsidiary of Reed Elsevier
  – One of the world’s largest providers of business, professional, scientific/health information

• Two Key Software Solutions
  – Payor decision support/ predictive analytics/
    payor profiling
  – Hospital outcomes profiling/ reporting

• Unique Core Competencies
  – MITCH data mining and prediction engine
  – Intelligent data clean-up logic
  – Healthcare expertise
The State of Healthcare

• Healthcare Cost Rising
  – United States spends more than twice as much on each person for health care as most other industrialized countries. But it has fallen to last place among those countries in preventing deaths through use of timely and effective medical care.¹

• Healthcare Quality is Not Improving
  – The World Health Organization's ranking of the world's health systems places US at #37

• Patient Safety Clearly Remains a Concern

• Fragmentation Continues to Plague the System

International Comparison of Spending on Health, 1980–2006

Average spending on health per capita ($US PPP*)

- United States
- Germany
- Canada
- Netherlands
- France
- Australia
- United Kingdom

* PPP = Purchasing Power Parity.

Healthcare Quality is Not Improving
Dimensions of a High-Performance Health System

Source: Commonwealth Fund National Scorecard on U.S. Health System Performance, 2008
Poor Coordination: Nearly Half Report Failures to Coordinate Care

Percent U.S. adults reported in past two years:

- Your specialist did not receive basic medical information from your primary care doctor: 13%
- Your primary care doctor did not receive a report back from a specialist: 15%
- Test results/medical records were not available at the time of appointment: 19%
- Doctors failed to provide important medical information to other doctors or nurses you think should have it: 21%
- No one contacted you about test results, or you had to call repeatedly to get results: 25%
- Any of the above: 47%

### Potential Impact on Patients if the United States Improved National Performance to Benchmark Levels

<table>
<thead>
<tr>
<th>Category</th>
<th>Current national average</th>
<th>2020 target*</th>
<th>Impact on number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of adults (ages 19–64) insured, not underinsured</td>
<td>58%</td>
<td>99%</td>
<td>73 million increase</td>
</tr>
<tr>
<td>Percent of adults (age 18 and older) receiving all recommended preventive care</td>
<td>50%</td>
<td>80%</td>
<td>68 million increase</td>
</tr>
<tr>
<td>Percent of adults (ages 19–64) with an accessible primary care provider</td>
<td>65%</td>
<td>85%</td>
<td>37 million increase</td>
</tr>
<tr>
<td>Percent of children (ages 0–17) with a medical home</td>
<td>46%</td>
<td>60%</td>
<td>10 million increase</td>
</tr>
<tr>
<td>Percent of adult hospital stays (age 18 and older) in which hospital staff always explained medicines and side effects</td>
<td>58%</td>
<td>70%</td>
<td>5 million increase</td>
</tr>
<tr>
<td>Percent of Medicare beneficiaries (age 65 and older) readmitted to hospital within 30 days</td>
<td>18%</td>
<td>14%</td>
<td>180,000 decrease</td>
</tr>
<tr>
<td>Admissions to hospital for diabetes complications, per 100,000 adults (age 18 and older)</td>
<td>240</td>
<td>126</td>
<td>250,000 decrease</td>
</tr>
<tr>
<td>Pediatric admissions to hospital for asthma, per 100,000 children (ages 2–17)</td>
<td>156</td>
<td>49</td>
<td>70,000 decrease</td>
</tr>
<tr>
<td>Medicare admissions to hospital for ambulatory care–sensitive conditions, per 100,000 beneficiaries (age 65 and older)</td>
<td>700</td>
<td>465</td>
<td>640,000 decrease</td>
</tr>
<tr>
<td>Deaths before age 75 from conditions amenable to health care, per 100,000 population</td>
<td>110</td>
<td>69</td>
<td>100,000 decrease</td>
</tr>
<tr>
<td>Percent of primary care doctors with electronic medical records</td>
<td>28%</td>
<td>98%</td>
<td>180,000 increase</td>
</tr>
</tbody>
</table>

* Targets are benchmarks of top 10% performance within the U.S. or top countries.

Where Do We Go From Here?

• Where?
  – To an environment of accelerated use adoption and use of effective HIT

• Why?
  – To improve care outcomes, safety and value
  – Reduce medical errors
  – Facilitate information exchange across care sites emphasizing patient-centered care and reducing unnecessary tests
  – Reduce duplication and enhance coordination

• How?
  – Accelerate Adoption and Use
  – Require electronic reporting of clinical information—use payment incentives
  – Initial funding to support spread to safety net and set up exchange

Current Economic Initiatives

• Pay for Performance
• CMS Mandates of non payment for:
  – Never Events
  – Hospital acquired infections
• Emphasis on Population Management
  – Medication Therapy Management
  – Disease Management
• Stimulus Package (ARRA)
  – EHR adoption
  – Prevention & Wellness
  – HIE initiatives addressing fragmentation of care
Predictive Modeling Provides:
Patient-centric Content, an Intelligence Engine and a Point-of-Care Presence
Leveraging Predictive Modeling Across the Care Continuum

- Address the fragmentation in healthcare
- Utilize patient-centric databases
- Leverage retrospective and prospective information
- Facilitate the aggregation of data
- Provide stakeholders with what they need to know when they need to know it
- Facilitate physician engagement
- Improve quality
- Better resource utilization
Predictive Modeling for Payors

“Facilitate Quality Improvement & Contain Costs”

- Identify & Stratify high-risk/high-impact members who are motivated in order to provide appropriate care
- Multiple risk projections (i.e., inpatient, ER, pharmacy) help focus appropriate care interventions
- Addresses Prevention & Wellness initiatives
- Promotes effective disease management initiatives
Predictive Modeling for Physicians

“Engage Physicians”

- Meaningful use of HIT
- Risk stratification for all patients
- Access to Current Data around compliance for their patients
- Identify patients with gaps in care for various diseases
- Access to complete patient history
- Real-time compliance and outpatient/inpatient visit history
- Single point of access that fits into the physicians workflow
- Interface with disease management/care management
Predictive Modeling for Consumers

“Empower Consumers”

- Consumers need accurate and **Timely Data** to better manage their care
- Provide effective and efficient targeted programs based on disease, risk and motivation
Predictive Modeling for Hospitals

“Enhanced Decision Support at Point of Care”

- Provides insight into the status of patients admitted whose condition is at risk for rapid decline
- Drives proactive intervention and avoidance of hospital-acquired complications
- Enhances use of healthcare HIT by addressing meaningful use criteria
How Can Predictive Modeling Be Leveraged within the Current Economic Initiatives?

- Provides multiple risk projections (i.e., inpatient, ER, pharmacy) to help focus appropriate care interventions
- Facilitates prevention and wellness via evidence-based medicine guideline analysis to minimize or reduce chronic disease progression
- Engage consumers in managing their health
- Assists physicians in meeting pay-for-performance requirements
- Addresses fragmentation of care
Current Economic Initiatives

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ARRA EHR Adoption

• Program Purpose:
The goal of the Medicare and Medicaid Health IT provisions in the Recovery Act is to promote and provide incentives for the adoption of certified electronic health records (EHRs). To achieve this goal, the Recovery Act authorized bonus payments for eligible professionals (EPs) and hospitals participating in Medicare and Medicaid as an incentive to become meaningful users of certified EHRs.

• Kinds and Scope of Program Activities:
Must meet the definition of “Meaningful Use” of a certified EHR

• Total of $19.2 Billion

• Responsible Organization:
Individual States & CMS
Funding Distribution Channels

**Distributed 2 Ways**

<table>
<thead>
<tr>
<th>Individual Physicians</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambulatory</strong></td>
<td><strong>Inpatient</strong></td>
</tr>
<tr>
<td>The Recovery Act authorizes bonus payments for eligible professionals and hospitals participating in Medicare or Medicaid if they become <em>meaningful users</em> of certified EHRs.</td>
<td>Acute care hospitals with at least 10 percent Medicaid patient volume would also be eligible for payments</td>
</tr>
<tr>
<td>Establishes 100 percent Federal Financial Participation (FFP) for States to provide incentive payments to eligible Medicaid providers to purchase, implement and operate (including support services and training for staff) certified EHR technology. It also establishes 90 percent FFP for State administrative expenses related to carrying out this provision.</td>
<td>Incentives paid out over the next 5 years</td>
</tr>
</tbody>
</table>

*CMS is overseeing and administering the incentive program and is coordinating with the Office of the National Coordinator for Health Information Technology (ONC)*
EHR Adoption
Predictive Modeling Value Proposition for Physicians

• Single Point of Access that Fits the Physician Workflow
  – Electronic access to lab and Rx data
  – Access to complete patient histories
  – Access to evidence-based guidelines
    • Data Entry Capability for Forced Compliance/Exclusion
    • Near Real-time Update to Guideline Compliance

• All Patient View for Emergency Room Physicians
Predictive Modeling Value Proposition for Hospitals

- Predict patients at risk for preventable readmissions
- Proactively identify which patients might develop a hospital acquired infection
- Identify events and conditions that affect both the operational and financial health of a hospital before they happen
- Mitigate non-reimbursable conditions or complications
Predictions Make it Easy to Identify and Respond to High-Risk Patients in hospitals

- Aggregates real-time data from EHR
- Develops patient-specific predictions in the in-patient setting
- Monitors the high-risk patient throughout the entire hospital stay
- Creates clinical alerts based on information gathered
- Delivers the alert to the appropriate caregiver
ARRA Prevention & Wellness

• Program Purpose:
The overarching goal of the initiative is to reduce risk factors and prevent/delay chronic disease, promote wellness, and better manage chronic conditions. This program will spend appropriated funds to execute evidence-based clinical and community-based prevention and wellness strategies that the Public Health Service Act authorizes. This program will deliver specific, measurable health outcomes that address chronic disease rates.

• Kinds and Scope of Program Activities:
HHS is currently developing a plan that specifies the kind and scope of activities that HHS will fund to achieve the program’s objectives. HHS is considering various approaches for this program.

• Total of $1.0 Billion Split Into 2 Categories:
  – $300 Million for Immunization
  – $650 Million to carry out evidence-based clinical and community-based prevention and wellness strategies

• Responsible Organization:
Department of Health and Human Services
The Chronic Care Dilemma

Seventy-five cents of every healthcare dollar we spend is on treatment of chronic disease, most of which is preventable.

Source: Almanac of Chronic Disease 2008
Using Preventative Care Makes a Difference

Predictive Modeling Value Proposition

• Proactively Identify Patients Not Following Evidence-based Treatment Protocols
  – Reduce risk factors
  – Prevent/delay chronic disease
  – Promote wellness

• Provide **Timely** Feedback to Providers
  – Did the patient follow through with testing?
  – Is the patient filling/refilling medications?

• Consolidate and Deliver Comprehensive Patient Histories to Deliver Better Chronic Care Management
  – Does the patient see other physicians?
  – Are there poly pharmacy issues?
ARRA Health Information Exchange (HIE)

• **Program Purpose:**
  The Health Information Technology for Economic and Clinical Health (HITECH) Act provisions of the Recovery Act of 2009 create a historic opportunity to improve the health of Americans and the performance of the nation’s health system through an unprecedented investment in health information technology (HIT).

• **Kinds and Scope of Program Activities:**
  1. Inform Health Care Professionals: Provide critical information to healthcare professionals to improve the quality of care delivery, reduce errors and decrease costs.
  2. Improve Population Health: Simplify collection, aggregation and analysis of anonymized health information for use to improve public health and safety.

• **Total of $300M specifically for health information exchange (HIE)**

• **Responsible Organization:** Health & Human Services/ Office of the National Coordinator for Health Information Technology
Predictive Modeling
Value Proposition

• Provide a variety of Analysis and Reporting solutions used to analyze the integrated data about patients, their conditions, the services and treatments they’ve received and the results of those treatments.

• Solutions include statistical analysis, data mining and pattern recognition, among others.

• Solutions can be linked to a Web-based access capability that will provide ad hoc and standard report access capabilities as well as personalized dashboards that provide score-card presentation of key metrics important to each user.
In some cases, the cost with complications could be more than 2x higher than without complications.

<table>
<thead>
<tr>
<th>Year 1 Disease</th>
<th>Count</th>
<th>Year 2 Complication</th>
<th>Year 2 Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Description</td>
<td>%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>35,855</td>
<td>Myocardial Infarction</td>
<td>1%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>35,855</td>
<td>CVA, TIA</td>
<td>4%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>35,855</td>
<td>Chronic &amp; Acute Renal Failure</td>
<td>2.8%</td>
</tr>
<tr>
<td>Asthma</td>
<td>24,115</td>
<td>Pneumonia</td>
<td>5.2%</td>
</tr>
<tr>
<td>Chronic Renal Failure</td>
<td>1,443</td>
<td>Acute Renal Failure</td>
<td>14%</td>
</tr>
<tr>
<td>CHF</td>
<td>4,320</td>
<td>CVA, TIA</td>
<td>10.7%</td>
</tr>
</tbody>
</table>