Bridging the Gap: Using Predictive Analytics to Connect Payors, Physicians, and Hospitals

The Second National Predictive Modeling Summit
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Agenda

• Novant Background
• MEDai Background
• State of the Industry
• Identifying the Need for Predictive Analytics
• Applying it in Payor, Physician and Hospital Settings
The Novant Facts

- Inpatient facilities 9
- Licensed beds 2382
- Long-term care facilities 2
- Building three new hospitals
- Based in North Carolina
- Serving NC, SC, VA, GA & TN
- Employees 20,076
- Medical Group Physicians 804
- Active medical staff 1,674
- Emergency department visits 280,917
- Surgeries 86,980
- Cath lab procedures 57,630
- Births 15,145
- Inpatient discharges 96,959
- Inpatient days 506,097
- Physician medical group visits 2,739,476
The MEDai Facts

• Orlando-based Information Technology Company since 1992

• Two Key Software Solutions
  • Predictive Modeling for Payors: Risk Navigator Suite
  • Outcomes Profiling & Predictive Modeling for Hospitals: Pinpoint Suite

• Unique Core Technology
  • Multiple Intelligent Tasking Computer Heuristics (MITCH)
    • Most Accurate
    • Blended technology
    • World Renowned Scientist
Problems

• Healthcare is fragmented
• Data is not shared with stakeholders
• Consumers are being impacted negatively
• Physicians are minimally involved
Where Is The Industry Today?

- A disproportionate share of medical costs are incurred by chronic care patients
- Limited resources requires effective allocation and management
- Sufficient data exists but many players do not have the analytical tools to generate accurate, actionable insights
- Providers do not have the infrastructure in place to become engaged in the care management process (i.e., identify their patients by disease state, utilize and comply with disease management guidelines)
A Significant Portion of Health Care Costs are Driven by Chronic Care

Patients with chronic medical conditions account for:

- 76% of inpatient admissions
- 88% of prescription drug use
- 96% of home care visits
- 72% of physician visits

Source: Chronic Conditions: Making the Case for Ongoing Care; December 2002; Partnership for Solutions, Johns Hopkins University, for The Robert Wood Johnson Foundation

Population Contribution to Total Health Care Costs

<table>
<thead>
<tr>
<th>Membership</th>
<th>Medical Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>95%</td>
<td>45%</td>
</tr>
<tr>
<td>4%</td>
<td>28%</td>
</tr>
<tr>
<td>1%</td>
<td>27%</td>
</tr>
</tbody>
</table>


- Chronic Disease – 50-75% of US healthcare spend
- Chronic Diseases – 125mm Americans with at least 1 chronic disease, 45mm with >2 chronic conditions
Predictive Modeling Historical Approach

• Used Trigger Lists to Identify Patients
  – Dollar threshold
  – Inpatient and/or ER visits
  – Specific Diagnoses

• Identifies Patients Too Late in the Care Process to Make a Real Impact
Prior Cost Identification

Results

Members in Top 1%
Current Year

- Percentage in top 1% prior year: 27%
- Percentage not in top 1% prior year: 73%
Traditional Identification will identify members who will naturally see a decrease in spending regardless of intervention activities.

Regression to the Mean

Top 2% Member and Cost Distribution

- **Members with Decreasing Cost**
  - 37% of Members
  - 70% of Total Cost

- **Members with Increasing Cost**
  - 63% of Members
  - 30% of Total Cost
All guidelines are not equal! Manage the *right* members.

### Ability to Impact Cost Varies by Disease

<table>
<thead>
<tr>
<th>Disease</th>
<th>% of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>0.6%</td>
</tr>
<tr>
<td>CAD</td>
<td>2.4%</td>
</tr>
<tr>
<td>COPD</td>
<td>2.7%</td>
</tr>
<tr>
<td>CVA</td>
<td>3.0%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.4%</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

High Impact Population

### Chronic Conditions with EBM Guideline Non-Compliance

- Asthma: 0.6%
- CAD: 2.4%
- COPD: 2.7%
- CVA: 3.0%
- Diabetes: 1.4%
- Heart Failure: 11.0%
So...What Do We Need?

*Provide Care Managers with Appropriate Information to Identify the Right Member at the Right Time*

- **Identify appropriate members for interventions**
  - Prioritize members for intervention
    - Identify High Cost members and “Movers”
    - Evaluate “Impact Index” – Members with most impactable gaps in guidelines or forecasted acute care and assessment of cost impact
    - Risk stratification (1-5) assists in development of appropriate interventions

- **Access member-specific actionable information**
  - Member Clinical History
  - Member Risk Profile
  - Member Specific Guideline Gap report

- **Conduct summary and detailed reporting**
  - Provider Profiling
  - Employer Reporting
  - Disease Profiling
The Solution Should…

• Provide High-Risk Identification
  – Only Step 1
  – Catastrophic members often not high impact

• Identify Movers
  – Helps with “regression to the mean” issues

• Forecast Inpatient Days, ER Visits and Rx$
  – Individualized action plans per member

• Forecast High Chronic Impact Members
  – Best opportunity for chronic care savings
  – Best opportunity to impact cost by intervening with evidence based guidelines

• Implement Forecast via Impact Index
  – Acute & Chronic Impact Index
  – Easily ranks members

• Allow for Workflow Integration
  – Detailed member profiles
Insights are Leveraged in Multiple Functional Areas

• **Care Management** – Identify and stratify patients for focused interventions

• **Physician Integration** – Engage physicians with support for disease management and guideline compliance

• **Actuarial and Underwriting** – Enhance rate setting capabilities and support actuarial processes
Identify Trends and Cost Predictions for Renewals

• **Employer-Specific Reporting**
  – Identify disease trends
  – Develop employer-based intervention programs

• **Forecast Employee Medical Costs**
  – Optimal pricing accuracy for renewals
  – Lab information allows prediction of new cases

• **Underwriting/Actuarial Support**
  – Understand trends
  – Provide enhanced employer reporting
  – Improve account management efforts
Payors are Realizing Positive Results from Financial Incentive Programs

An employer coalition experienced improved care costs after the first six months of its diabetic incentive program:

- Decreased total hospital charges
- Decreased average charge per admit
- Decreased average charge per day

Source: The Employers’ Coalition on Health (IL) Reported Experience

Source: Anthem BCBS-NH Reported Experience
It is Difficult to Engage Physicians Because They Do Not Have Access to Relevant Information

According to CMS CCI Initiative:

“Patient care can be fragmented and poorly coordinated and patient information difficult to integrate among settings as patients move from one care setting to another. Providers may lack timely and complete patient clinical information to fully assess their patients’ needs and to prevent complications.”

% of Recommended Care Received

- 64.7% Hypertension
- 63.9% Congestive Heart Failure
- 54.9% Preventive Care
- 53.9% Colorectal Cancer
- 53.5% Asthma
- 45.4% Diabetes
- 39.0% Pneumonia
- 22.8% Hip Fracture
**Solution:**
A Strategic Alliance that Combines Content, an Intelligence Engine and a Point-of-Care Presence
Aggregation of Disparate Data Sets Provides More Accurate Predictive Power

- Aggregates and analyzes medical claims pharmacy and lab information, HRAs
- Intensive data clean-up process
- Aggregation of data into clinical episodes (ETGs)
- Incorporate non-homogeneous data

Leads to
- Superior accuracy
- Comprehensive clinical view

Leads to
- Superior accuracy
- More insightful clinical findings
- Standardized episodes of care
- Increased flexibility in modeling
• Developed proprietary prediction engine:
  – MITCH (Multiple Intelligent Tasking Computer Heuristics)

• Split data into 2 years

• Use Year 1 data to predict Year 2 cost

• Identify Modeling Clusters and select best drivers
  – Diseases, enrollment groups, product line
Insights are Generated Around the Population and Members are Stratified Accordingly

1. Well & Low Risk Members (Prevention)
2. Low Risk Members (Prevention and Disease Management)
3. Moderate Risk Members (Disease Management)
4. High Risk, Multiple Disease States (Episodic Case Mgmt-Inpatient Clinical Guidelines)
5. Complex Care (Inpatient - LTC)

Prevention
Case Management
Disease Management
Health Plan Usage Scenario
Care Manager can generate a member list of High-Risk Diabetics

<table>
<thead>
<tr>
<th>Member ID</th>
<th>Forecasted Risk Index</th>
<th>Impact Index</th>
<th>Gender</th>
<th>Age</th>
<th>Months Enrolled</th>
<th>Total Cost</th>
<th>Forecasted Cost</th>
<th>PCP ID</th>
<th>Care Mgmt</th>
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<tbody>
<tr>
<td>265961357-01</td>
<td>24.47</td>
<td>34.76</td>
<td>F</td>
<td>49</td>
<td>12</td>
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<td>$65,230</td>
<td>280220</td>
<td>M/CMP</td>
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<td>261982551-00</td>
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<td>F</td>
<td>51</td>
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<td>$50,474</td>
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<td>432822244-00</td>
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<td>20.35</td>
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<td>CHF</td>
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<tr>
<td>264667722-00</td>
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<td>6</td>
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<td>$46,510</td>
<td>217691</td>
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<tr>
<td>220764091-00</td>
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<td>356201154-00</td>
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<td>$40,575</td>
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<td>267882619-01</td>
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<td>265866783-00</td>
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<td>F</td>
<td>54</td>
<td>12</td>
<td>$25,612</td>
<td>$40,188</td>
<td>252218</td>
<td>Asthma</td>
</tr>
</tbody>
</table>

**Group Aggregate**

<table>
<thead>
<tr>
<th></th>
<th>Avg Forecasted Risk Index</th>
<th>Avg Impact Index</th>
<th>Percent Female</th>
<th>Avg Age</th>
<th>Avg Months Enrolled</th>
<th>Avg Total Cost</th>
<th>Avg Forecasted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member Cnt</td>
<td>1468</td>
<td>5.00</td>
<td>5.87</td>
<td>52%</td>
<td>12</td>
<td>$13,596</td>
<td>$13,552</td>
</tr>
</tbody>
</table>
And can then drill down into the individual member profile for a comprehensive clinical profile.
This section of the profile shows the drugs filled by the member during the prior 12 months.

<table>
<thead>
<tr>
<th>Therapeutic Class</th>
<th>Count</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTI-ULCER PREPS/GASTROINTESTINAL PREPS</td>
<td>3</td>
<td>$ 55</td>
</tr>
<tr>
<td>ANTICOAGULANTS</td>
<td>11</td>
<td>$ 1,443</td>
</tr>
<tr>
<td>ANTICONVULSANTS</td>
<td>7</td>
<td>$ 508</td>
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<tr>
<td>ANTIDIARRHEALS</td>
<td>2</td>
<td>$ 0</td>
</tr>
<tr>
<td>ANTINAUSEANTS</td>
<td>2</td>
<td>$ 0</td>
</tr>
<tr>
<td>ANTIPARASITICS</td>
<td>1</td>
<td>$ 3</td>
</tr>
<tr>
<td>ANTIPARKINSON</td>
<td>6</td>
<td>$ 87</td>
</tr>
<tr>
<td>ATARACTICS-TRANQUILIZERS</td>
<td>8</td>
<td>$ 107</td>
</tr>
<tr>
<td>CEPHALOSPORINS</td>
<td>2</td>
<td>$ 113</td>
</tr>
<tr>
<td>CHOLESTEROL REDUCERS</td>
<td>1</td>
<td>$ 9</td>
</tr>
<tr>
<td>DIABETIC THERAPY</td>
<td>7</td>
<td>$ 115</td>
</tr>
<tr>
<td>DIAGNOSTICS</td>
<td>7</td>
<td>$ 306</td>
</tr>
<tr>
<td>DIGITALIS PREPARATIONS</td>
<td>9</td>
<td>$ 2</td>
</tr>
<tr>
<td>DIURETICS</td>
<td>11</td>
<td>$ 2</td>
</tr>
<tr>
<td>ELECTROLYTES &amp; MISCELLANEOUS NUTRIENTS</td>
<td>9</td>
<td>$ 22</td>
</tr>
<tr>
<td>GLUCOCORTICOIDS</td>
<td>1</td>
<td>$ 0</td>
</tr>
<tr>
<td>LIPOTROPICS</td>
<td>8</td>
<td>$ 26</td>
</tr>
<tr>
<td>MEDICAL SUPPLIES</td>
<td>3</td>
<td>$ 1</td>
</tr>
<tr>
<td>MISCELLANEOUS</td>
<td>5</td>
<td>$ 107</td>
</tr>
<tr>
<td>MUSCLE RELAXANTS</td>
<td>10</td>
<td>$ 17</td>
</tr>
<tr>
<td>NARCOTIC ANALGESICS</td>
<td>15</td>
<td>$ 61</td>
</tr>
<tr>
<td>OTHER ANTIBIOTICS</td>
<td>1</td>
<td>$ 71</td>
</tr>
<tr>
<td>OTHER CARDIOVASCULAR PREPS</td>
<td>10</td>
<td>$ 327</td>
</tr>
</tbody>
</table>
The Risk Profile breaks down the forecast by condition.

### Member Information
- **Member ID**
- **Member Name**
- **Group Name**
- **Care Mgmt Program**
- **Age**
- **Gender**
- **Months Enrolled**
- **Active (Y/N)**

### Risk Summary

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Contribution to Forecast</th>
<th>Risk Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>$ 297</td>
<td>0.83%</td>
</tr>
<tr>
<td>Arrhythmia Disorders</td>
<td>$ 1,731</td>
<td>4.86%</td>
</tr>
<tr>
<td>CHF Conditions</td>
<td>$ 1,308</td>
<td>3.68%</td>
</tr>
<tr>
<td>Cerebral Vascular Disorder</td>
<td>$ 4,584</td>
<td>12.88%</td>
</tr>
<tr>
<td>Coronary Artery Related Conditions</td>
<td>$ 3,948</td>
<td>11.10%</td>
</tr>
<tr>
<td>Dermatological Disorder</td>
<td>$ 1,065</td>
<td>3.05%</td>
</tr>
<tr>
<td>Diabetic Disorders</td>
<td>$ 1,711</td>
<td>4.81%</td>
</tr>
<tr>
<td>Heart Related Conditions</td>
<td>$ 1,799</td>
<td>5.05%</td>
</tr>
<tr>
<td>Hypertensive Disease ETG</td>
<td>$ 937</td>
<td>2.63%</td>
</tr>
<tr>
<td>Major Infection Related Conditions</td>
<td>$ 1,558</td>
<td>4.38%</td>
</tr>
<tr>
<td>Metabolic Conditions</td>
<td>$ 4,909</td>
<td>13.79%</td>
</tr>
<tr>
<td>Miscellaneous Conditions</td>
<td>$ 4,194</td>
<td>11.79%</td>
</tr>
<tr>
<td>Musculo–skeletal Disorders</td>
<td>$ 1,041</td>
<td>2.93%</td>
</tr>
<tr>
<td>Myocardial Infarction Related Conditions</td>
<td>$ 1,628</td>
<td>4.57%</td>
</tr>
<tr>
<td>Neurological Disorder</td>
<td>$ 1,446</td>
<td>4.06%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>$ 2,340</td>
<td>6.58%</td>
</tr>
<tr>
<td>Urinary Disorders</td>
<td>$ 1,070</td>
<td>3.01%</td>
</tr>
</tbody>
</table>
The Impact Profile illustrates the gaps in care for a particular patient.
Results

Diabetes
- 6 months into new approach
  One day per week CDE in MD office
- Single practice with 61 identified Diabetic patients (59 with HTN)
- $100,000 annual savings in single MD office

Population results
- 15% reduction in Hgb A1C in 6 months
- 40% decrease inpatient / 26% decrease ED
- 50% cost reduction

Repeat Years
- $2.50 savings per $1 cost
Results - Continued

- **Asthma**
  - 67% decrease in hospital admissions
  - 75% decrease in emergency room utilization
  - $800 per member savings initial year
    - A Disease Management Program Utilizing “Life Coaches” for Children with Asthma
  - Repeat Year - $4 savings per $1 cost

- **Schizophrenia**
  - 59% decrease in hospital admissions
  - 26% decrease in emergency room utilization
  - 44 diversions in 9 months
Physician Challenges

- EMR not yet widely available
- Varied approaches by payor
- Multiple payors per physician practice
- Patients are only human
- Rapid evolution of best science – months
- Retrospective feedback minimally useful
- Who really owns the problem???
- Plan - MD relationship
- P4P, Pat. Satisfaction, CMS reporting
Physicians Need:

- Health plans to share claims data
  - *Your data… but My patient and My job!*

- Easy-access web portal solution

- Single point of access that fits into the physicians workflow
  - Identify patients with gaps in care for various diseases
  - Access to complete patient history
  - Risk stratification for all patients
  - EBL guidelines timely & updated
  - Real-time compliance and outpatient/inpatient visit history
  - Lab trending
  - Limited Input capabilities
  - MD Care alerts with filter setting
  - DM/Care Management interface
Hospital Emergency Rooms Need:

➢ Reduction of unnecessary testing (x-rays, lab, etc.)
➢ Access to patient information including:
  ➢ Complete Medical Claims History
  ➢ Medication Compliance
  ➢ Historic Lab Results
  ➢ Prospective risk determination or prospective guideline prompt
Wish List??

- Metabolic Syndrome assessment and guidelines
- GAD antibodies, TPO antibodies, etc.
- Bicuspid Aortic valve (2% of pop.)
- hs-CRP (synergistic with Met Syn?)
- MRSA aggregated Hx
- DM II and testosterone levels
- Asthma and Depression link
Integration With Providers Provides Critical IT Tools and Engages Them in the Process

**Physician and Hospital ER Portal**

- **Member History (IP, OP, Pro, Rx, Lab)**
- **Gap Analysis – Evidence-based guidelines**
- **Disease-State Reporting**
Effective Use of IT Supports the Health Plan Functions and Enables the Provider

Summary of Differentiators:

- Engages the physician in the care management process
- Easy identification of patients who have gaps in their care
- Sophisticated and industry-leading accuracy, including outliers
- Multiple risk projections (i.e., inpatient, ER, pharmacy) help focus appropriate care interventions
- Incorporates lab data for increased accuracy and additional clinical insights
Provider Usage Scenario
# Physician Patient List

## My Patient List

<table>
<thead>
<tr>
<th>Disease Registry</th>
<th>Diagnosis Profile</th>
<th>Utilization Profile</th>
</tr>
</thead>
</table>

### Physician Demographics (based on all patients for the current physician)

- **Physician Name**: UHXM-THLX, SNME
- **Physician ID**: 030774
- **# Patients**: 496
- **Avg Total Cost**: $2,995
- **Avg Forecasted Cost**: $3,623

## Patient List

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>DOB</th>
<th>Primary Disease</th>
<th>Total Cost</th>
<th>Forecasted Cost</th>
<th>Risk Index</th>
<th>Asth...</th>
<th>CAD</th>
<th>COPD</th>
<th>CVA...</th>
<th>Depr...</th>
<th>Diab...</th>
<th>Drug Mgmt</th>
<th>Heart Failu...</th>
<th>Hep...</th>
<th>HIV</th>
<th>Hyp...</th>
<th>Lower Back Pain</th>
<th>Migr...</th>
<th>Multi...</th>
<th>Scler...</th>
<th>Oste...</th>
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<tbody>
<tr>
<td>LNMSKF, GNOT...</td>
<td>02/2...</td>
<td>Cardiovascular disease</td>
<td>$35,483</td>
<td>$17,437</td>
<td>5.05</td>
<td>67 %</td>
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<tr>
<td>ONUXOSR IO, V...</td>
<td>08/1...</td>
<td>AIDS</td>
<td>$14,195</td>
<td>$17,056</td>
<td>4.94</td>
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<tr>
<td>LNRXKXE, CHK...</td>
<td>08/0...</td>
<td>Conduction disorder</td>
<td>$64,503</td>
<td>$16,754</td>
<td>4.85</td>
<td>67 %</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>83 %</td>
<td></td>
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<tr>
<td>CHKKHTLR-LNS...</td>
<td>11/1...</td>
<td>CNS Neoplasm</td>
<td>$3,094</td>
<td>$16,008</td>
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<tr>
<td>LAOQXK, ITHLX</td>
<td>10/3...</td>
<td>AIDS</td>
<td>$13,231</td>
<td>$15,311</td>
<td>4.43</td>
<td></td>
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<tr>
<td>RSXOQXR, ON...</td>
<td>05/1...</td>
<td>Conduction disorder</td>
<td>$10,462</td>
<td>$15,106</td>
<td>4.37</td>
<td>60 %</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>25 %</td>
<td></td>
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<tr>
<td>RXOQXS, ITVP...</td>
<td>04/0...</td>
<td>CNS Neoplasm</td>
<td>$11,152</td>
<td>$14,322</td>
<td>4.14</td>
<td>0 %</td>
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<tr>
<td>KXBRHRM, ZHR...</td>
<td>10/2...</td>
<td>AIDS</td>
<td>$12,004</td>
<td>$14,256</td>
<td>4.13</td>
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<tr>
<td>WTBHR-QTHYN...</td>
<td>08/1...</td>
<td>Breast neoplasm</td>
<td>$7,497</td>
<td>$13,746</td>
<td>3.98</td>
<td>100 %</td>
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<tr>
<td>RLHSG, ITHQTO...</td>
<td>08/2...</td>
<td>Epilepsy</td>
<td>$12,307</td>
<td>$13,557</td>
<td>3.92</td>
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<tr>
<td>TLHKTVQ, OHX...</td>
<td>03/1...</td>
<td>Degenerative Or...</td>
<td>$13,969</td>
<td>$13,162</td>
<td>3.61</td>
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<tr>
<td>TKXDTMWXQ, K...</td>
<td>03/2...</td>
<td>Prostate neoplasm</td>
<td>$14,545</td>
<td>$12,264</td>
<td>3.55</td>
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<tr>
<td>JHQIKTMW, X...</td>
<td>01/0...</td>
<td>Pneumonia</td>
<td>$11,080</td>
<td>$11,802</td>
<td>3.41</td>
<td>100 %</td>
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<tr>
<td>SONE, TMSGNE...</td>
<td>07/1...</td>
<td>Congestive Heart...</td>
<td>$1,961</td>
<td>$11,721</td>
<td>3.39</td>
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<tr>
<td>IXONIX, GTQO...</td>
<td>12/0...</td>
<td>Cerebrovascular disease</td>
<td>$7,812</td>
<td>$10,375</td>
<td>3</td>
<td>67 %</td>
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<td></td>
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<td></td>
<td></td>
<td>60 %</td>
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</tr>
<tr>
<td>UEOW, RCHOK...</td>
<td>01/2...</td>
<td>Diabetes</td>
<td>$6,969</td>
<td>$9,057</td>
<td>2.62</td>
<td>57 %</td>
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<tr>
<td>ZNPFTKXF, MH...</td>
<td>03/2...</td>
<td>Arthritis, tendonitis</td>
<td>$4,774</td>
<td>$8,615</td>
<td>2.49</td>
<td></td>
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</tr>
<tr>
<td>RSTMKXE, JHLL...</td>
<td>03/0...</td>
<td>Hypertension</td>
<td>$963</td>
<td>$8,497</td>
<td>2.46</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>25 %</td>
<td></td>
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</tr>
<tr>
<td>GGXXK, WMQ...</td>
<td>01/3...</td>
<td>Diabetes</td>
<td>$2,851</td>
<td>$3,282</td>
<td>3.40</td>
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</tbody>
</table>
# Patient Profile

## Patient Demographics

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>RTMWXOR, IATMHST</th>
<th>Total Cost</th>
<th>$165,762</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>123 MAIN STREET ANYTOWN, ST 12345-6789</td>
<td>Forecasted Cost</td>
<td>$109,784</td>
</tr>
<tr>
<td>Age</td>
<td>59</td>
<td>Risk Index</td>
<td>31.77</td>
</tr>
<tr>
<td>Gender</td>
<td>F</td>
<td>RX Detail?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## Patient Diagnosis

**Primary Condition**: Fracture or dislocation of lower extremity, with surgery - foot and ankle

**Co-Morbidities**:
- Chronic renal failure, with ESRD
- Major inflammation of skin & subcutaneous tissue
- Late effects and late complications
- Minor inflammation of skin & subcutaneous tissue
- Benign hypertension with comorbidity

## Care History

<table>
<thead>
<tr>
<th>Visit Type</th>
<th>Date of Service</th>
<th>Primary Diagnosis</th>
<th>Procedure Description</th>
<th>Provider Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER Visit</td>
<td>10/25/2005</td>
<td>STUTTERING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient Stay</td>
<td>10/25/2005</td>
<td>STUTTERING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient</td>
<td>08/03/2005</td>
<td>FX DISTAL RADIUS NEC-CL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>03/16/2006</td>
<td>GANGRENE</td>
<td>OFFICE CONSULTATION, PROBLEMS OF MO...</td>
<td></td>
</tr>
</tbody>
</table>

## Maintenance Drug Compliance

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Last Fill Date</th>
<th>% Compliance</th>
<th>Next Fill Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>METOPROLOL TARTRATE</td>
<td>01/23/2006</td>
<td>66.4%</td>
<td>04/24/2006</td>
</tr>
<tr>
<td>CLONIDINE HCL</td>
<td>01/23/2006</td>
<td>66.4%</td>
<td>04/24/2006</td>
</tr>
</tbody>
</table>
## Top Patient Diagnosis Care History Maintenance Drugs Lab Opportunities Guideline Compliance

### Laboratory Clinical Opportunities

<table>
<thead>
<tr>
<th>Lab Test Name</th>
<th>First Test - Abnormal?</th>
<th>First Test - Date</th>
<th>First Test - Result</th>
<th>Last Test - Abnormal?</th>
<th>Last Test - Date</th>
<th>Last Test - Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### Guideline Compliance

<table>
<thead>
<tr>
<th>Guideline Group</th>
<th>Description</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventive Care - Woman</td>
<td>Breast cancer screening: Women 40-69 years</td>
<td>Yes</td>
</tr>
<tr>
<td>Preventive Care</td>
<td>Colon cancer screening: Age 50 and older</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>Tobacco avoidance</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Influenza immunization: Individuals age 5-64 with chronic conditions</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>Influenza immunization: Individuals age 50 to 64</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>Pneumonia immunization: Age &gt;=65 or 2-64 with chronic condition</td>
<td>NO</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>Plus Hypertension: ACE-I, ARB, beta-blocker, diuretic or digoxin; Age &gt;=18</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Plus Hypertension: echocardiogram, age = 18</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>ACE-I, ARB or beta-blocker; Age &gt;= 18</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>ACE-I, ARB, diuretic, beta-blocker or digoxin; Age &gt;=18</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Plus Hypertension: ACE-I, ARB or beta blocker; Age &gt;=18</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Diuretic plus serum chemistry panel or potassium; Age &gt;=18</td>
<td>Yes</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Eye exam (retinal) performed</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Hemoglobin A1c (HbA1c) testing</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>With nephropathy: ACE-I or ARB</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>LDL-C screening performed</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Plus Hypertension: ACE-I, ARB, beta-blocker, diuretic, calcium channel blocker</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Hospital Usage Scenario
Evidence and Data

Evidence-based information on what to do next

Clinical and comparative data

Actionable Knowledge
Hospital Solution

Pinpoint Review™

Utilize EMR on a near-real-time basis to:

- Generate evidence-based alerts at POC
- Provide predictions while patients are still in the hospital (pre-discharge)
  » Readmission for Medicare & Indigent Populations
  » Predict hospital acquired infections (Sepsis)
  » Predict heart attacks in the ER
Improved Performance

Elsevier Solution

- Measure performance & identify areas for process improvement – Pinpoint Quality™
- Establish interdisciplinary order sets – Order Set Solution
- Nurse Care Plans reflecting order sets - CPMRC
- Measure performance improvement post order set implementation – Pinpoint Quality
Summary

Predictive Analytics:

- Address the fragmentation in healthcare
- Facilitate the aggregation of data
- Provide stakeholders with what they need to know when they need to know it
- Facilitates MD engagement
- Improves quality
- Better resource utilization