Using Predictive Modeling to Identify Medicaid Members for Case and Disease Management

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Objectives

• Designing a care management program using predictive modeling tools
• Understanding the value of risk stratification in identifying and targeting members for the appropriate interventions
• Using the comprehensive, disease-specific assessments to validate the member’s health status and develop a plan of care
• Define strategies for engaging and promoting long-term self-management
• Define appropriate outcome measures based on the goals of the program
Task: Designing a Care Management Program

• Example Population
  – 150,000 Medicaid members
  – Prevalent conditions among the population:
    ▪ Diabetes
    ▪ CAD
    ▪ COPD
  – Conditions that account for the most dollars spent among the population:
    ▪ Endocrinology (malignant neoplasm, other endocrinology)
    ▪ Cardiology (atherosclerosis, major arterial disease, aortic aneurysm)
    ▪ Neurology (major brain and spinal trauma, stroke)
• Program goals
  – Improve health outcomes, using evidence-based medicine
  – Prevent avoidable medical costs through improving self-management skills
  – Reduce ER visits and inpatient admits
  – Co-management of co-morbidities, i.e. behavioral health
  – Improve quality scores (HEDIS) and member satisfaction
  – Promote a medical home model
  – Deploy resources effectively and maximize staffing skill sets
Why Use Predictive Modeling?

- To identify different pockets of risk within a population – members with specific diseases and conditions who are most likely to develop catastrophic medical or financial outcomes.
- It provides a starting point for placing members into different “buckets” of risk without having to first do an assessment on each individual member.
- Synthesizes medical health, behavioral health, pharmacy utilization and lab results.
Predictive Modeling

• Our predictive modeling tool uses episodes of care to identify risk. This information is combined with prior utilization of health care services and prescription drugs to predict future health risk.

• Patient risk markers can be both predictive as well as provide insights into why a patient is of high risk

• Future risk example:

Joe

• Age 57
• Insulin dependent diabetic
• Congestive heart failure
• Chronic bronchitis

Predicted Annual Cost: $25,432
### Joe’s Relative Risk Score & Predicted Future Costs:

<table>
<thead>
<tr>
<th>Markers of Patient Risk</th>
<th>Relative Risk Score</th>
<th>Predicted Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Insulin dependant diabetes, with co-morbidity, (base marker)</td>
<td>1.121</td>
<td>$2,233</td>
</tr>
<tr>
<td>Service Inpatient Stay, diabetes primary within recent 3 months</td>
<td>3.193</td>
<td>$6,360</td>
</tr>
<tr>
<td>Clinical CHF, with Co-Morbidity, (base marker)</td>
<td>1.426</td>
<td>$2,841</td>
</tr>
<tr>
<td>Service Significant CHF episode clusters, recent 3 months</td>
<td>4.911</td>
<td>$9,783</td>
</tr>
<tr>
<td>Clinical Chronic bronchitis, with co-morbidity, (base marker)</td>
<td>0.652</td>
<td>$1,299</td>
</tr>
<tr>
<td>Service Blood, anticoagulants, CHF</td>
<td>0.857</td>
<td>$1,707</td>
</tr>
<tr>
<td>Demographic Male, 55 to 64</td>
<td>0.607</td>
<td>$1,209</td>
</tr>
<tr>
<td>Total</td>
<td>12.767</td>
<td>$25,432</td>
</tr>
</tbody>
</table>
Predictive Modeling

- Risk methodologies features:
  - Leverage up to 12 months of claims information as input
  - Predict relative risk of total costs (both medical and pharmacy) or utilization risk for a future 12-month time period — the following 12 months
  - Predict risk at the individual member level
  - Provide flexibility by leveraging the input data available to support the appropriate predictive model
Which Members Should be Targeted?

- Predictive modeling outputs to consider:
  - Overall measure of future risk
  - Prediction of future health care costs
  - Inpatient stay probability (within the next 3 months)
  - Probability of one or more admissions
  - Care opportunities
  - Impact scores - “actionability” (based on tailored case definitions)
  - Primary risk factor
  - Impactable Conditions

What is impactable?
Risk Stratification of Example Population

• **Field High Risk** – managed by field-based care managers
  – Top 1% of the population based on *Future Risk, Costs*
  – Includes all conditions

• **Telephonic High Risk** – managed by telephonic care managers
  – Top 10% of the population based on *Future Risk, Costs* (excluding the population managed in the field)
  – Must have one or more of the following conditions:
    - Asthma, diabetes, CAD, COPD, CHF, hemophilia, HIV/AIDS, schizophrenia, sickle cell disease and HTN
Level One (Low Acuity)

- Annual Mailings based on identified medical conditions (usually a single condition)
- Member Newsletters (general health information)
- HRA and Claims data from predictive modeling tool identifies Level One members and monthly file forwarded to fulfillment house for mail distribution
- Members with “gaps in care” or care opportunities receive combination of post card “reminders” and outreach “reminder” calls
- Future Capabilities – allow PCP and member to “view” care opportunities on-line via web portal
Care Level Determination

Predictive Modeling Engine

Data-Driven Preliminary Risk Stratification

- Low Risk Members
- Moderate Risk Members
- High Risk Members

Call member → Enroll member → Complete comprehensive assessment

Determine appropriate management of member based on risk score & assessment

Employ Clinical Judgment

Risk Assmt

Field-based care management

Telephonic-based care management

Continue to monitor, via predictive modeling

Continue to monitor, via predictive modeling
Using Predictive Modeling at the Member Level

• Prior to even communicating with a member, predictive modeling provides care managers with a knowledge base about an individual member’s:
  
  – Episodes of care
  – Pharmacy utilization
  – Inpatient admissions
  – Clinical indicators associated with medical conditions
  – Care opportunities (missing preventive and disease specific measures)
  – Care alerts (critical areas of concern)
  – Risk information – primary risk factor, risk score, etc.
Care Team’s Use of Predictive Modeling

- Care Manager
  - Reviews disease-specific tests and medications
  - Analyzes clinical indicators and episodes of care, to evaluate diagnoses for which claims have been submitted
  - Reviews inpatient admissions and ER visits for frequency and appropriateness

- Behavioral Health Specialist
  - Review behavioral health history
  - Identify behavioral health care opportunities

- Pharmacist
  - Identifies poly pharmacy and reviews medications (i.e. on formulary and cross reference for interactions, allergies and appropriateness for disease state)
  - Drug recall
Comprehensive Assessment

- In order to validate the placement of the member into a particular care level, a comprehensive assessment is conducted.
- This provides valuable information about what is occurring with the member at that particular point in time (something predictive modeling is not guaranteed to do).
- Based on that assessment, the member may:
  - Remain in the care level initially assigned
  - Move to a more intense level of care
  - Move to a less intense level of care

Ultimately, clinical judgment is used to determine level of care.
The SF-12™ is an assessment of the member’s perception of their general health and well-being.

The SF-12™ evaluates the member’s ability to perform Activities of Daily Living and his/her emotional well-being.

If completed prior to member receiving care management and at the end of care management, may be an indicator of level of improvement in the member’s perception of their general health and well-being from participating in care management.
• The PHQ-9 is a powerful tool in helping identify depression

• Depending on the severity of depression, co-management of the member with a behavioral health specialist may be implemented

• Use of a behavioral health specialist with specific knowledge about appropriate community resources is essential
Plan of Care

- Care opportunities are an output of predictive modeling that enhance cost savings by identifying members who would derive the most value from current managed care programs using customizable care profiles and evidence-based guidelines targeted to specific member populations and resources.

- Upon validation, these care opportunities are incorporated into the plan of care, along with areas identified from the assessment.

- The plan of care is organized into these main problem categories:

  - Medical
  - Behavioral
  - Social
  - Preventive
  - Pharmaceutical
Engage & Promote Long-Term Self-Management

• Strategies:
  – Keeping the Care Opportunities in mind, evaluate with member the missing preventive and disease-specific measures
  – Educate member on the importance of disease self-management skills and preventive health measures
  – Work with member to achieve optimal self-management skills
  – Evaluate the effectiveness of the educational measures and member’s level of self-management
  – Evaluate level of compliance with obtaining preventive measures
Choosing Appropriate Outcome Measures

• Claims-based:
  – ER visits / 1,000
  – Inpatient admissions / 1,000
  – Inpatient readmissions / 1,000
  – Office visits / 1,000
  – Average Length of stay (ALOS)
  – Disease-specific clinical indicators

• Patient reported outcomes:
  – Perceived health status: SF-12™ results
  – Member satisfaction: annual questionnaire
Member Success Story

• **Member:** 61 years old, Caucasian male, lives with spouse

• **Chronic conditions:** congestive heart failure, hypertension, atrial fibrillation

• **Length in program:** 1 year

• **Upon joining the program, the member:**
  – Did not have a blood sugar monitor
  – Was unaware of his A1C number
  – Was unaware of his cholesterol levels
  – Was in need of an insulin refill
  – Did not want to change his eating habits
  – Was not interested in exercising
Member Success Story

• **Interventions:**
  – The care manager developed a relationship with the member’s PCP and found out that the PCP would not refill insulin until an office visit was made
  – The care manager continually educated the member about eating healthy as a diabetic, monitoring blood sugar daily, starting an exercise program

• **Intermediate success:**
  – Routinely monitor blood sugar
  – Blood sugar consistent at 200
  – Consistent follow-up with PCP
  – Started walking 2-3 blocks each day
Member Success Story

• **After 1 year, the member:**
  – Monitors his blood sugar every day
  – Consistently has blood sugar numbers in the high 90s to low 100s
  – Has modified his diet
  – Walks for a half hour every day
  – Consistently goes to PCP appointments

► Positive lifestyle change
► Improved quality of life
► Demonstration of self-management skills