

# Predictive Modeling

## NEWS

## Innovative Applications of Risk Adjustment for the Evaluation and Financing of Medical Homes

by Phi Ho, Business Analyst, Verisk Health, Waltham MA

### Why Primary Care? Why a Medical Home?

There is a significant focus on primary care in the United States. The amount of funds provided for pilots in healthcare reform legislation reinforces the importance of getting primary care right. Studies have consistently shown that an increase in primary care access can lead to better health, lower costs and reductions in socio-demographic and socio-economic disparities in care. As the foundation of healthcare delivery, primary care is in desperate need of change. Medical home initiatives have been built on the premise of better primary care overall and have become a key outlet for healthcare reform efforts.

Despite the prevalence of literature on this topic, defining a medical home often proves difficult. Organizations have developed varying criteria for practices to be considered a medical home. The National Committee for Quality Assurance attempts to mitigate the ambiguity by providing a formal set of patient-centered medical home criteria consisting of 10 elements. However, thus far, criteria developed and accepted by the healthcare industry focus primarily on alleviating issues associated with the delivery system, such as poor quality of care, lack of access and communication and fragmentation of healthcare services.

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## Predictive Modeling and Analytics Help Prevent Claim Overpayments

by Rodger Smith, Senior Vice President for Claim Audit and Recovery Services, SCIOinspire Corp.

### Introduction

To the uninitiated, it would appear that healthcare reimbursement should be a straightforward process: The provider documents medical services delivered to a patient, attaches the correct set of codes, submits the claim for payment – and the payer cuts a check for the requested amount. What could possibly go wrong?

Unfortunately, a lot. Coding conventions are complex, both for the services provided and for the diagnoses treated, and seem ever-changing. New diagnostic and therapeutic services become available. Coverage rules and regulations are modified. Data entry errors occur.

These variables complicate the claim adjudication process. Payers are investing more resources in increasing the percentage of claims being paid correctly and avoiding overpayments, but there is still much work to do. This time- and labor-intensive effort can be streamlined, however, thanks to advanced analytical solutions such as predictive modeling applications. These software tools can be configured with parameters and algorithms that help detect claims requiring review and identify root causes of claim overpayments. This not only reduces incorrect claims payments, but helps payers identify problem areas for correction.

To prevent overpayments, eligibility/COB issues must be addressed simultaneously in the claims, enrollment and overpayment departments. Health plans should institute multidimensional analytical and predictive modeling solutions that can accommodate overpayment identification and recovery as well as solutions to ensure the quality of eligibility/COB data.

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## Managed Care Pharmacists Study Predictive Aspects of Medication Therapies

*Managed care pharmacy continues to emphasize use of predictive analytics, and poster presentations prepared for the Academy of Managed Care Pharmacy's 2010 Educational Conference, held in St. Louis in October, featured that combination of disciplines prominently. Here are edited selected abstracts from those presentations, as they were featured in the September 2010 issue of the association's Journal of Managed Care Pharmacy.*

### Acute Medication Use Among Americans with Chronic and Episodic Migraine

Noting that "evaluating patterns of acute migraine treatment in the population is an important first step toward optimizing interventions for migraine care," the researchers set out to "determine acute medication use for patients with chronic migraine and episodic migraine in the United States." To do so, "data collection included sociodemographic and clinical characteristics and acute medication use in the past four weeks by migraine group. Frequency and duration were reported for select acute medications including triptans, narcotics and combination products." Results included these: "Respondents with chronic migraine were 1.9 times more likely than those with episodic migraine to take narcotics, and they took [those] medications on more days than respondents with EM. Those with CM were 1.4 times more likely to take triptans than those with EM. For participants with CM, days of medication use exceeded the definition of medication overuse for all acute treatments examined."

### Association of Patient Cost-Cutting Behaviors with Clinical Outcomes, Health Status and Lost Work Productivity in Individuals with Rheumatoid Arthritis

The researchers note that "in an effort to reduce rising healthcare costs, there has been a trend in managed care toward greater patient cost-sharing. However, in this time of economic recession, high costs may necessitate cost-cutting decisions by individuals, especially those with multiple, costly chronic conditions." So they set out to "quantify cost-cutting behaviors in patients with rheumatoid arthritis and assess the association of [those] behaviors with clinical outcomes, health status and work productivity loss." To do so, patient "cost-cutting behaviors were assessed for six months. Differences in outcomes were compared between patients with identified cost-cutting behaviors and those without. Patient demographics and comorbidities were adjusted using linear regression for clinical outcomes and health status and negative binomial regression for lost work productivity." Of respondents, "41.6% reported at least one cost-cutting behavior. The most frequently reported behaviors were delaying RA-related physician visits, taking RA prescription medication less often and reducing [the] number of RA prescriptions filled. After adjustment, cost-cutting behavior was associated with greater functional disability; severity of morning stiffness, fatigue and pain; and poorer health status. Among the employed, patient cost-cutting behaviors were associated with 1.39 times the amount of overall work impairment compared with those without employment."

### Characterizing Disease Progression and Costs in Patients with Systemic Lupus Erythematosus in a Managed Care Setting

Because "systemic lupus erythematosus may worsen over time, especially with flares of increased disease activity," the researchers set out to "describe characteristics and compare healthcare resource utilization and cost for SLE progressors with nonprogressors." Progressors were defined as "having higher disease severity in either year of the two-year follow-up period than in the baseline period." Nonprogressors were defined as "patients whose baseline disease severity did not worsen over the two-year follow-up period." In the research, "direct healthcare costs and utilization were assessed." The researchers found that "a substantial proportion of SLE patients progressed in disease severity over two years. Progressors were significantly more likely to have emergency room, inpatient and outpatient hospital visits, and healthcare costs were approximately \$10,000 more compared with nonprogressors."

Visit the journal at [www.amcp.org](http://www.amcp.org).

### **Innovative Applications of Risk Adjustment...continued**

True innovation within the context of medical homes relies not only on the delivery system, but also on delivery financing. The current fee-for-service model used by payers and providers incentivizes overutilization, with no regards for quality, cost or patient health. To bend the cost curve, healthcare organizations are looking for new ways to finance primary care. The key to successfully implementing medical homes is to develop payment systems that address misaligned incentives for patient care, underpayment for primary care and prevention services and ineffective quality and efficiency performance programs.

#### **Financing in the Context of Medical Homes**

In the current, widely accepted fee-for-service model, a payer negotiates discounts off unit costs with providers in exchange for volume and attempts to manage utilization through provider profiling. As a result, the healthcare system produces a high volume of high-cost services that are not necessarily correlated to quality care, and preventative services are often under-reimbursed. An innovative approach to healthcare financing lies in a bundled payment mechanism: a risk-adjusted base rate coupled with pay-for-outcomes bonus payments. But how do we pay for outcomes? A payer negotiates a bundled payment for certain services and encourages appropriate utilization and preventative medicine. By doing so, primary care providers are incentivized to give the right amount of care: Too many services rendered means they lose money, while too few services leads patients to seek care in the ER, which also results in a loss of profits for providers.

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# The Missing Piece in Risk Adjustment for Medical Management

by Ksenia Draaghtel ASA MAAA, Associate Actuary, Milliman Inc.

**B**esides its primary application in renewal rating, risk adjustment has established a reputation as a valuable tool for medical management and is used extensively in that capacity. The question we hear most often from medical management teams is: "How can a risk adjuster help to identify and differentiate between actionable and non-actionable cases?" The goal of medical case management is to provide a systematic approach for identifying and coordinating medical care. The key need lies in identifying appropriate members with actionable characteristics amenable to medical management in order to achieve costs savings.

A single risk score, capturing a member's relative risk as compared to an average population, is simply not enough, nor is it necessarily informative for case management. From an underwriting perspective, knowing that a group (or an individual) contributes 20% more risk than an average group (or individual) is extremely valuable information. The same information, however, is not very useful in distinguishing the best candidates for case management among the high-cost members. But suppose a risk adjuster could provide information not only on the clinical risk drivers, but also on the percentage contribution of each driver to the total expected risk.

Table 1 presents examples of members with similar overall risk scores but very different risk profiles. The two individuals presented in Table 1 have prospective risk scores in the range of 1.40 to 1.50. From an underwriting perspective, both individuals are of equal risk and we would expect both to be 45% more expensive than an average individual. However, if we break down each risk score into clinical drivers, we see a very different picture. While the majority of costs for Joseph come from chronic conditions, mental deficiency and cataracts, Anna's conditions are short term in nature (pregnancy-related) and most likely require no medical management. Knowing whether the majority of the risk is coming from an actionable or non-actionable condition is even more critical in optimally allocating limited resources.

**Table 1**

Risk Score		Risk Score	
<i>Joseph</i>	1.41	<i>Anna</i>	1.47
Condition	% of Clinical Risk	Condition	% of Clinical Risk
Mental Deficiency or Retardation	39%	Pregnancy	15%
Cataracts	14%	Antepartum Hemorrhage	15%
Limb Pain	3%	Amenorrhea	13%
Other	44%	Other	56%

Source: Milliman Advanced Risk Adjuster, Comprehensive, Prospective 0 month lag model

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## Innovative Applications of Risk Adjustment...continued

Rewarding quality over quantity would lead to improved quality of care, optimal utilization and lowered costs. However, any bundled payment model must address key obstacles to be successful:

- **Perform outstanding risk adjustment.** Sick patients will inevitably cost more. To prevent adverse selection of members, payment levels must take into account the illness burden of a physician's population. The sickest patients often provide opportunities for the greatest cost savings.
- **Bundle payments for primary care activities.** Most practices are not financially capable of accepting all the risk. A full risk transfer would make primary care physicians accountable for events that they cannot control, such as a catastrophic car accident. These costs must be carved out of the payment model.
- **Make primary care profitable.** Key activities of the medical home are not reimbursed, such as improved and more frequent communication between the practice and patients. Medical homes typically result in 25% to 30% more labor costs. Operational changes to support a medical home increase costs, which makes it imperative to develop an appropriate financing model that rewards primary care physicians appropriately
- **Focus on pay-for-outcomes.** In addition to a bundled payment, outcome bonuses based on clinical quality metrics should account for substantial additional revenue. These must also be risk-adjusted to avoid adverse selection. A pay-for-outcomes model avoids formal utilization management as a cost containment strategy and allows the practice to focus on patient care.

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**Innovative Applications of Risk Adjustment...continued**

**Risk Adjustment as the Foundation for Financing Medical Homes**

The key to implementing a successful pay-for-outcomes model, which is the basis for financing medical homes, is to utilize risk-adjustment methodology. Risk adjustment enables payers to provide physicians with fair and balanced payment for providing specific primary care services to all patients, including procedures, care coordination, EMR utilization and access. Risk adjustment prevents providers from selecting only the healthiest patients and encourages high-quality care and appropriate utilization.

Verisk Health has developed risk-adjustment models specific to medical homes. The Primary Care Activity Level model determines the risks associated with primary care-specific activities, which can be used to set partial capitation rates. To eliminate the incentive of selecting only the healthiest patients, payers can reward physicians by providing outcomes-based bonus payments using risk-adjusted outcomes models -- utilization metrics such as count of admissions, emergency department visits and advanced imaging -- to promote good outcomes.

**Case Study: Evaluating Medical Homes Using Risk-Adjustment Technology**

Previously, physician performance metrics were unadjusted for illness burden. As such, comparisons between pilots and control groups were done on an “apples-to-oranges” basis. Inaccurate comparisons left plans in a poor negotiating position with practices, prompting the search for a more sophisticated approach than a typical risk-adjustment model. Earlier this year, Verisk Health was approached by a health plan in the Midwest to help evaluate the performance of its patient-centered medical home practices. The total member population for the health plan is just below 100,000. Two practices -- one internal medicine and the other family medicine -- were chosen as the sites for the medical home pilot, which ran through 2009. Only the commercial population was evaluated. The analysis done using Verisk Health’s predictive models indicated with statistical significance a higher cost-efficiency among the pilots relative to their control groups. The actual (observed) total medical and pharmacy costs for the pilots were less than expected costs, given the characteristics of the population. The health plan’s total medical and pharmacy costs for the control groups did not show similar cost-efficiency. Moreover, the models illuminated cost-efficiency changes year-over-year within respective study groups. The year prior to the evaluation period, the pilots were less efficient than expected, but in turn were efficient during the pilot period. However, the health plan’s total practices excluding the pilots showed no changes in cost year over year.

While cost-efficiency analysis is important to understand the viability of medical homes, utilization and quality of care are perhaps more telling evaluation metrics that can provide actionable solutions.

The performance models are calibrated to evaluate population-level utilization metrics that are both clinically relevant and financially meaningful. Risk-adjusted ED visits, hospitalizations and imaging models allow the health plan to evaluate utilization performance across Family Medicine and Internal Medicine practices with no systematic bias.

It was no surprise when the models verified that outcomes performance tends to cluster – performing better or worse than expected in one metric generally leads to similar results in another metric.

**Conclusions**

Financing a medical home requires primary care to shift away from fee-for-service reimbursement to a model that measures and rewards cost savings and quality. In a medical home model, plans would provide the primary care team with adequate resources to support desired activities, and clinical professionals can decide how to use those resources with more autonomy. Although no standard medical home financing model has been established, a risk-based comprehensive payment combined with risk-based rewards for high performance offers the most promising solution.

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