Improving Health Care Quality and Controlling Costs – The Critical Role of Disease Management

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Disease management (see definition at end of paper) companies have burst on the health care scene over the past few years promising to assume the “mantle” of managed care. Unfortunately, many have not met their promise to deliver coordinated care at decreased costs. Yet, the opportunity remains for disease management companies to significantly improve quality of care via coordinated services while controlling costs. This paper argues that, to demonstrate to the purchaser (a managed care organization or MCO, employers and an ever increasing number of individual consumers) the cost-effective nature of their services, disease management entities need to:

- Carefully assess the sickness burden of their patients using well-validated classification methodologies applicable to every type of health care encounter
- Take advantage of the past several decades’ of research on health care delivery and, in particular, on the movement to improve quality

These well-validated methodologies must be open to research and purchaser scrutiny. The black box, involving undisclosed and/or difficult to replicate logic and systems that are not published in peer-reviewed literature, methods that disease management companies often use to document their monetary impact, may have been acceptable in the early days of disease management but should not be acceptable today.

In addition to discussing the characteristics of well validated methodologies, this paper will provide sample reports that link quality and cost for each type of health care
encounter that disease management companies should begin to adapt and use in a standardized manner for both internal management and external demonstration purposes for customers. The latter are not just the typical paying clients but the broader public and individual family members that need to understand the value that disease management can bring to the quality of life of patients.

Subhead: Disease Management Needs to Take Advantage of Important Findings of Health Services Research

Using these newer methodologies, disease management companies need to take advantage of several prominent themes that can be derived from health services research. First and most important, researchers have documented the tremendous variation in practice patterns (for example, treatment for complications from strokes and variation in diabetes care) that exist not only between cities in different parts of the country but within zip codes in the same city. ¹ Much of this variation results in and from poor quality care.

Second, the quality improvement movement has specified the key components of a quality improvement initiative that are necessary for achievement of outstanding performance from both a cost and quality perspective. ² In particular, the CQI movement has focused on the importance of leadership. Disease management executives need to lead the way and be much more active in documenting results of their efforts to coordinate care at a reduced price. Poorly coordinated care for people with chronic illnesses is an important factor driving up costs. Disease management entities and executives can provide a key leadership role in documenting the impact of true
coordinated care on quality improvement. This paper argues that it is in their financial interest to do so.

Third, research on health care delivery has continually documented that lack of health insurance coverage has an impact on the health of the uninsured and underinsured. While disease management executives may believe that they have nothing to offer the uninsured. They should join providers fighting these cutbacks as the drastic cutbacks in Medicaid services and employer based coverage can only diminish the services that some disease management companies are providing chronically ill Medicaid recipients who have lost or are about to lose their coverage.

Yet, for reasons that will be explored in this article, health care leaders from the disease management community have not taken sufficient advantage of these findings to improve quality while controlling costs. Implementation of these findings with the use of financial incentives to improve quality is what is needed. We should not be aiming necessarily for the lowest bypass graft rate, for example, as the “correct” rate. Rather, our leaders from every level of the health care, consumer, provider and purchaser communities, should be demanding that data be continuously adjusted for case and severity differences at a local provider level to identify and examine the sources of variations in care that can establish “best practice” rates for bypass grafts that takes into account important sources of variation.

By examining the variation in the quality and cost of health care services with tools available today, disease management entities can more effectively identify, the
opportunities for quality improvement and cost reduction. Disease management companies need to provide their customers (employers, consumers and providers) with a regular set of reports that document the impact of their efforts. These reports need to be based on tools that contain the following characteristics:

- Logic that is open for external validation and not based on, as a colleague recently stated, a “secret sauce.”
- External validation of the work via, at a minimum, peer reviewed, publications.
- Specific logic that takes into account severity of illness and, if present, co-existing chronic illnesses. These two features are particularly needed with the following type of health care encounters: episodes of illness, hospital stays, and long term care. Incorporating severity is less necessary for general medical ambulatory visits.

Relentless examination of data in combination with financial and quality incentives are the only way for disease management to truly control costs and narrow variations in care and thus improve quality for the diseases they are managing.

**Subhead: Why the “Secret Sauce” or Classification Methodology Needs to be Open for External Validation and Ideally Should Be Categorical**

In deciding what attributes they should seek in the classification methodologies they decide to use, disease management companies should learn from the Diagnosis Related Group (DRG) experience that Medicare has been using for the past twenty years and which has resulted in estimated annual savings of 20 billion dollars per year and a literal revolution in quality management. Several key attributes of this classification system for inpatient services were critical to its success. Because DRGs were developed as a
methodology consisting of groups of clinically similar patients, a language was created that linked the clinical and financial aspects of care. The outcome or dependent variable was always specified. Initially, the dependent variable was resource consumption. Over time, newer DRG variants, as will be discussed below utilized additional dependent variables emphasizing quality. The importance of the communication value of DRGs cannot be emphasized enough. The language of DRGs provided administrators and physicians a meaningful basis for evaluating both the processes of care and the associated financial impacts. Indeed, DRGs were originally developed to be a management tool. The availability of a DRG definitions manual, in which the clinical characteristics of each DRG were clearly specified, was essential for creating a basis of communications, and nearly 100,000 copies of the DRG definitions manual have been distributed.

The categorical nature of DRGs permits separation of computation of relative payment weights and definition of DRG clinical categories. Such a separation is an inherent by-product of the categorical nature of DRGs and cannot be readily implemented in non-categorical systems. For example, payment rates could be computed on the basis of linear or logistic regression techniques. In a regression model, certain clinical factors are used as variables in the regression. The coefficients in the regression equation would be equivalent to the relative payment weights in the DRG system. However, in a regression model, the clinical model and payment coefficients are inextricably intertwined. There is no independent definition of the clinical model and the payment coefficients. Issues such as interpretation of negative coefficients must be evaluated before the regression model is finalized. Such capabilities are not readily available for most payers. The dynamic nature of treatment processes and methods and the complexities of using regression techniques
require the payer to depend on the developer of a regression-based risk-adjustment system for ongoing updates to the system. In contrast, the simple computation of average values needed to compute DRG payment weights can be easily accomplished by most payers and allows payers to update the payment system independent of the developers of the DRGs.

**Subhead: Tools to Measure Quality and Cost of Services**

There are many tools available today that have built on the DRG experience and have been extended to inexpensively measure aspects of payment and quality (i.e. value which simplistically means quality/cost) for every type of health care encounter. Over the past few years, physicians, in particular, have expressed concerns that case mix systems such as DRGs are only useful for payment purposes and cannot be used for quality improvement purposes. In response, researchers have developed new case mix tools that, for example, adjust for the complexity of bypass grafts. These new tools are useful for quality management purposes in addition to payment. Listed below are examples of tools for each type of health care encounter (Additional tools which intellectually compete with those listed and for which there are peer-reviewed publications are cited in this article’s references):

- Ambulatory Patient Groups (APGs) or Ambulatory Payment Classification (APCs) – Visits
- All-Patient Refined DRGs (APR-DRGs), Disease Staging, R-DRGs, Medsgrps, Caduceus– Hospital Stays
- Clinical Risk Groups (CRGs), Hierarchical Cost Conditions, Adjusted Clinical Groups (ACGs), Episode Treatment Groups (ETGs) – Episodes
Subhead: Implementation of Financial and Quality Incentives

This paper maintains that it is not possible for disease management entities to improve quality and stabilize costs without relentless examination and use of data that is case-mix and severity adjusted for every type of health care encounter. How do we obtain and use this data for continuous improvement? The required elements are evident and available but, until now, have been difficult to execute:

• Commitment of senior executives from disease management companies to lead on the basis of knowledge of quality and cost. Leading means using the data to improve quality and decrease cost.

• Collection of case mix and severity adjusted data for each type of health care encounter--from physician visits to hospital stays--to understand the activity of health care professionals/organizations

• Case mix adjusted financial and quality incentives for consumers, health professionals, MCOs and organizations (e.g., hospitals) to use the data for improvement.

Ambulatory Services – Visits and Episodes of Illness

Ambulatory services represent the principal locus of coordinated care, and can be the starting point for stabilizing health care budgets while maximizing quality. There are two axes of classification of ambulatory services: visits and episodes. With respect to visits, Table 1 represents a sample visit-based report that payers, disease management companies and providers should be receiving. Table 1 provides risk-adjusted data (i.e., a
mix of procedures ranging from endoscopies to bunionectomies) for surgeons. One could also examine, for example, assess outcome variables such as hospital admissions and/or emergency room visits following outpatient procedures. A classification system such as APGs is superior to CPT as the latter have too many meaningless code splits that do not add important distinctions and have the problem of making case mix adjusted comparisons much more challenging.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, John</td>
<td>110</td>
<td>0.10/0.05</td>
<td>0.2/0.1</td>
<td>4.3/5.8</td>
<td>82/85 +1.3/4.5</td>
<td>3 wks/2.5wks</td>
<td>84/89</td>
<td>+10%</td>
</tr>
<tr>
<td>Jones, Alice</td>
<td>85</td>
<td>0.03/0.05</td>
<td>0.15/0.1</td>
<td>7.8/5.8</td>
<td>89/85 +5.8/4.5</td>
<td>1.5wks/2.5</td>
<td>94/89</td>
<td>-8%</td>
</tr>
</tbody>
</table>

Table 1 - Severity Adjusted Ambulatory Visit Significant Procedure Report:

Table 2 represents a similar report organized around the significant procedures (e.g., diagnostic cardiac catheterization) instead of using the surgeon. Each APG category represents a group of procedures with a different case mix (or group of procedures). One cannot, for example, simply combine APG categories 71 and 72. Portions of this type of cost and quality information is needed for all parties, not just disease management entities themselves, interested in disease management – MCOs, purchasers, providers, individual patients. MCOs and individual customers need the information provided in Table 1 to assess for MCOs quality and budgetary performance (the last column provides an overall evaluation) while for consumers quality information is key for making a decision where to seek care. Depending on the type of coordinated care service it is providing, the information contained in Tables 1 and 2 are important for the disease management entity. Thus, a cardiology specialty disease management company would be very interested in
classifying the services its enrollees using the schema contained in Table 2. They would be interested in identifying which specialists were within the budget that the specialty company had calculated. It is much more concise, and thus more practical/ actionable, than one might find using CPT codes. It is the type of information that cardiology specialists, in this case, would clearly understand and, more importantly, be able to take action on. A disease management entity providing services ranging from telephonic case management to direct care in the home could also benefit from both Tables 1 and 2 as it decides which surgeons are providing the best value for the particular case mix adjusted group of procedures in question. Lastly, using the same APG methodology, disease management companies can work with the prime payer to create prospective rates for the services specified, for example, in Table 2. Over time the payer could package all services provided during the visit such as the equipment/pharmaceuticals and eventually create a bundled mini-episode of illness payment system that includes the visits that occur after the procedure. Unfortunately, disease management entities are not demanding this information from MCOs and/or tracking this type of data on a routine basis despite the fact that ambulatory services are exploding as inpatient services have shifted to the outpatient sector.

Table 2 – Financial Statement Outpatient Cardiovascular Product Line

<table>
<thead>
<tr>
<th>APG Category</th>
<th>Description</th>
<th>Count</th>
<th>Paid Amount ($)</th>
<th>Total Cost ($)</th>
<th>Profit or (Loss) ($)</th>
<th>Percent Profit or loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>Exercise tolerance tests</td>
<td>1,056</td>
<td>160</td>
<td>150</td>
<td>10,560</td>
<td>6.67</td>
</tr>
<tr>
<td>72</td>
<td>Echocardiography</td>
<td>969</td>
<td>210</td>
<td>224</td>
<td>(13,566)</td>
<td>-6.25</td>
</tr>
<tr>
<td>74</td>
<td>Cardiac electrophysiologic tests</td>
<td>4</td>
<td>1,250</td>
<td>1,524</td>
<td>(1,096)-</td>
<td>-17.98</td>
</tr>
</tbody>
</table>

When payers begin to seriously consider financial incentives with disease management companies, they should shift from fee-for-service or prospective payment to, ideally, pay
disease management companies and health professionals on the basis of episodes of illness that are clinically meaningful to the all parties to the health care table – including the consumer. This type of payment approach represents a language that links the clinical and financial aspects of care, as occurs in DRG based hospital payments. It systematically implies not only payment but also the regular feedback, using the same tools (so that payment can be linked to quality) of clinically valid reports of the type that can be found in Tables 3 through 6. Payers should be providing this feedback on a regular basis. Disease management entities and providers need to have them on a frequent basis to continuously narrow variation and identify new opportunities. Consumers – both payers and the individual recipients of coordinated care - should be receiving many of these same reports on, for example, a quarterly basis.

Table 3 provides feedback to disease management entities and health professionals on the projected future costs of patients with diabetes versus those with up to three chronic illnesses such as diabetes, congestive heart failure and chronic obstructive pulmonary disease. Severity level 1 diabetes is projected to consume far fewer resources (as indicated by their relative payment weights) than severity level 6 patients with the aforementioned triplet. Disease management entities need to create the same report on a retrospective basis and examine hospitalizations, average pharmacy use, emergency room visits, patient satisfaction and other process/outcome variables or costs issues. Simply put, neither purchasers nor disease management leaders should be satisfied with an overall savings score and/or overall patient satisfaction. Valid documentation of quality and cost impact must take into account severity of illness and presence of co-morbid illness. From a payment perspective, disease management entities should recognize the
payment value of working collaboratively with the prime payer such as the MCO to create severity adjusted case rates that take into account not only severity but the presence of co-morbid illness such as diabetes and congestive heart failure. This is attractive not only to all parties directly involved with payment issues but particularly providers and individual consumers both of whom appreciate the clear difference between a patient severity level 1 diabetes and a severity level 6 patient with congestive heart failure, chronic obstructive pulmonary disease and diabetes. Of even greater value is when the disease management company can precisely identify, from the clinical logic of a classification system open to external scrutiny, what clinical issues brought the patient, for example to severity level 6. As we will see below, the disease management company will be interested in more details on the specific identification of patients most appropriate for disease management. Payer and consumers will be interested in the impact that a disease management company has on patient outcomes – both quality and cost- using methodologies that are open to all for examination.

Table 3 – CRG Predicted Payment Weights by Severity Level for Individuals with Diabetes, Hrt Failure (CHF) and/or Chronic Lung Disease (COPD)

<table>
<thead>
<tr>
<th>Severity Level</th>
<th>CRG</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td></td>
<td>0.5953</td>
<td>0.7797</td>
<td>0.9246</td>
<td>1.3985</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM &amp; COPD &amp; CHF</td>
<td></td>
<td>1.4588</td>
<td>2.1968</td>
<td>2.5539</td>
<td>3.2849</td>
<td>4.2358</td>
<td>5.7845</td>
</tr>
</tbody>
</table>
Table 4 – Population Payment Weights by Severity Level – Commercial Population

<table>
<thead>
<tr>
<th>Severity Level</th>
<th>CRG Status</th>
<th>0/1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Healthy</td>
<td></td>
<td>0.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2- Significant Acute</td>
<td></td>
<td>1.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3- Single Minor Chronic</td>
<td></td>
<td>1.83</td>
<td>4.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - Multiple Minor Chronic</td>
<td></td>
<td>3.25</td>
<td>6.39</td>
<td>5.26</td>
<td>26.91</td>
<td>26.03</td>
<td>106.87</td>
</tr>
<tr>
<td>5 – Single Dominant or Moderate Chronic</td>
<td></td>
<td>2.46</td>
<td>6.39</td>
<td>4.38</td>
<td>9.18</td>
<td>13.41</td>
<td>12.26</td>
</tr>
<tr>
<td>6- Pairs Multiple Dominant and/or Moderate Chronic</td>
<td></td>
<td>6.39</td>
<td>11.26</td>
<td>15.51</td>
<td>22.03</td>
<td>43.26</td>
<td>102.28</td>
</tr>
<tr>
<td>7 – Triples Multiple dominant Chronic</td>
<td></td>
<td>13.59</td>
<td>20.10</td>
<td>26.91</td>
<td>26.03</td>
<td>106.87</td>
<td>67.86</td>
</tr>
<tr>
<td>8- Malignancies – Metastatic, Complicated or Dominant</td>
<td></td>
<td>8.64</td>
<td>18.74</td>
<td>27.45</td>
<td>50.21</td>
<td>102.28</td>
<td></td>
</tr>
<tr>
<td>9- Catastrophic</td>
<td></td>
<td>11.19</td>
<td>12.72</td>
<td>37.44</td>
<td>62.07</td>
<td>111.33</td>
<td>77.72</td>
</tr>
</tbody>
</table>

Table 5Enrollee Distribution by Health Status – Commercial Population

<table>
<thead>
<tr>
<th>Severity Level</th>
<th>CRG Status</th>
<th>0/1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Healthy</td>
<td></td>
<td>246,521</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2- Significant Acute</td>
<td></td>
<td>23,152</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3- Single Minor Chronic</td>
<td></td>
<td>15,440</td>
<td>1,494</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - Multiple Minor Chronic</td>
<td></td>
<td>978</td>
<td>69</td>
<td>267</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 – Single Dominant or Moderate Chronic</td>
<td></td>
<td>12,963</td>
<td>4,029</td>
<td>1,020</td>
<td>145</td>
<td>86</td>
<td>23</td>
</tr>
<tr>
<td>6- Pairs Multiple Dominant and/or Moderate Chronic</td>
<td></td>
<td>1,205</td>
<td>496</td>
<td>282</td>
<td>149</td>
<td>62</td>
<td>5</td>
</tr>
<tr>
<td>7 – Triples Multiple dominant Chronic</td>
<td></td>
<td>9</td>
<td>7</td>
<td>8</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8- Malignancies – Metastatic, Complicated or dominant</td>
<td></td>
<td>78</td>
<td>232</td>
<td>132</td>
<td>47</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9- Catastrophic</td>
<td></td>
<td>51</td>
<td>147</td>
<td>37</td>
<td>31</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

One should be able to aggregate the severity-adjusted data profiled in table 3 into the entire population under contract to the disease management entity. Using the same tool
profiling in Table 3, the data in Table 4 provides such a snapshot picture of projected next years’ costs for a commercial population of 250,000. Similar to Table 3, this same report needs to also be analyzed on a retrospective basis and one should compare different regions of the country, medical groups and health plans on a large number of variables, including rates of hospitalizations (preventable and non), outpatient pharmacy costs, emergency room visits and patient satisfaction using variables of interest to the ultimate consumer – the patient. What is key is to use an episode of illness model that groups enrollees in the disease management program into similar “buckets”. Then, the disease management program can array enrollees along dependent variables or patient characteristics of interest such as rates of hospitalizations (preventable and non), outpatient pharmacy costs, emergency room visits and patient satisfaction. While these first three tables (3 and 4) document the importance of first focusing on costs, there are reports focused on quality, such as patient satisfaction and hospitalization, which also must be examined. Table 6 focusses on quality by documenting what happened in 1999 to a group of severity level 1 diabetic patients.

Table 6: Outcome in 1999 for Severity level 1 1998 Patients with only Diabetes.
There will always be some deterioration in the severity of individuals with diabetes, for example. However, if a payer compares one disease management company with another, and sees that the deterioration rate is faster in company #2 as compared to #1, a payer and consumers should require company #2 to explain why the diabetic patients, whose care the company is theoretically managing, appear to be deteriorating at a rate faster than the norm. In comparing the two disease management entities, the payer or the disease management entities can use the same classification tool to ascertain exactly what conditions prompted the change in severity level. Similar to the DRGs, a categorical model can precisely identify in an open manner what are those clinical conditions.

Thus, in a categorical risk adjustment model, one could get additional information specifying exactly what caused the jump in severity from levels 1 to 3. For these patients, the following new onset diabetic related conditions caused the jump from levels one to three: retinopathy, neuropathy and nephropathy. It is this kind of clinical detail that allows the disease management entity to easily identify opportunities for improvement.
and to prioritize which opportunities have the greatest probability of success from a disease management intervention.

Different types of reports are appropriate at different levels of the disease management organization. Mid level managers need to see the same reports highlighted above for executives plus need to see reports such as those displayed in table 3. On a regular basis, the manager should see the most common (top 25) severity adjusted chronic conditions their disease management entity is managing. There should be two top 25 lists: by frequency and by cost. Each of these general types of reports should have the same retrospective monthly trend analyses of overall costs, hospital stays or bed days/thousand, ER visits, and pharmacy utilization/cost.

Line managers have the greatest responsibility in that they communicate directly with patients and providers. In coordination with their mid level managers, line managers need to examine the cost, frequency and hospitalization rate for high severity chronic illnesses - that is those most amenable to care management beginning with

- Asthma – highest severity level. At a lowest levels of severity, information should be mailed to these individuals making sure that they realize that a help line is available and that spirometers are available, ideally, free of charge.

- Congestive heart failure mid to high severity levels. This selection of which severity patients to focus on depend on the immediate objective of the intervention – prevention or cost control of highest costs patients. If it is the former, start with lower severity patients. If it is the latter, start with the high severity patients. Starting with low severity CHF or AODM patients will not
result in significant short term savings but will result in better long term outcomes.

• Diabetes – mid to high severity 3-4
• COPD – highest level severity
• Mental Health – highest level severity. These conditions are underestimated in terms of (incomplete)
• Doublets and triplets of all these combinations – mid to highest level of severity.
• Children with special needs (as defined by Maternal and Child Health Programs to include children with, for example, cerebral palsy). All levels. While intervention with children at low level of severity might not save a lot of money, it will impress the parents and this group of parents tends to be a very vocal and politically engaged group of individuals.

Line managers also need to use, ideally, the same type of episode of illness tool to identify high priority/must review/must coordinate care type of patients. Line managers need to target individuals who might not have consumed significant resources in the past but who are at considerable risk for “exponentially” increasing resource use in the future. These include individuals:

• With a high severity of illness, but a low resource consumption profile as compared to the group average weight since intervention now may help reduce or eliminate their need for expensive resources that others in their cohort have utilized
• In a low severity of illness level, but with increasing severity over time (uncontrolled asthma, deteriorating diabetes [such a diabetic who develops eye problems] or CHF)
• Newly categorized to a high resource consumption group, i.e., dialysis, TPN, HIV, ventilator dependent,

• If they have more than 3-5 visits within a period of two months and have one of the following types of chronic illnesses: Diabetes, Angina, Asthma, COPD, CHF

- Children with special needs and MH levels 3-4 need to have the opposite logic apply. That is, these children and individuals with high severity mental illnesses need to have regular encounters with the medical care system. If they drop out of the system, line managers need to consider an intervention.

Due to the rapidly rising costs of pharmaceuticals and the ever-greater impact that pharmaceuticals play in the health status improvement of patients, it is key that disease management companies link pharmaceutical data to every type of health care encounter. In particular, episode of illness classification and pharmaceutical data needs to be linked. Today most disease management companies produce useful reports documenting, for example, the excess use of expensive anti-inflammatory medications such as Celebrex or Vioxx. While controls on these medications are an important first step, disease management companies need to be aware of several methodologies available today that link the name and dosage of the pharmaceutical to the level of severity of the patient. This type of methodology is key to documenting the impact of coordinated care on quality and cost as it is still difficult for many disease management companies or managed care organizations to mechanically link claims containing visit-based diagnostic and/or procedural data (typically in I-CD-9-CM or CPT format) from different geographic sites into an overall patient description. In contrast, due to the strong efforts of disease management companies to control pharmacy costs, these entities often have linked
pharmacy data that can specify all the pharmaceuticals an individual has taken over the period in question.

The listing below provides a simplistic example of the use of the name and dosage of the pharmaceutical as an independent variable to better describe the severity of illness of a patient with, for example, congestive heart failure.

Level I  
Digoxin & Diuretic

Level II  
Digoxin & Ace Inhibitor
Ace Inhibitor & Diuretic

Level III  
Digoxin & Lasix & Metolozone
Digoxin & Lasix & HCTZ

Level IV  
Digoxin & Diuretic & Amiodarone

While the name and dosage of the pharmaceutical can add significant amount of information to the understanding of the severity of a patient with CHF, this is not true for all diseases. Thus, propranolol may be used for hypertension and/or migraine prophylaxis. Typically, methodologies that use pharmacy data will have epidemiologically based heuristic rules built into the clinical algorithm identifying, in the absence of diagnostic data, the most likely disease in question. This type of tool is of intrinsic value to the health professional not just because of the cost importance of pharmaceuticals but, more importantly, health professionals place credence in the use of pharmaceuticals as a marker of severity as long as the tool’s logic is open to scrutiny.
**Hospital Services**

Can disease management companies help control skyrocketing hospital costs? Medicare, the dominant payer for hospital services, compounds the problem by paying hospitals extra for complications that are avoidable. Disease management entities worsen the problem by either not taking on financial responsibility for hospital payments or, when they do, using methodologies such as per diems. Per diem payment provide neither the payer nor the provider with any information for identifying sources of variations in care or opportunities for quality improvement. These systems simply encourage gaming to occur by not providing any medical or financial incentive to provide efficient care.

One key to controlling hospital costs and increasing quality is creating a much stronger link between the hospital and physician. The health care industry needs to evolve to a point where the physician and hospital work under similar quality and cost incentives. Disease management entities need to be much more engaged with hospital care (both the physician and facility component) than they have traditionally been from both a quality of care and payment perspective. Historically, disease management companies have left the management of hospital care to the hospital discharge planner. DRG offshoot and other classification methodologies exist today that disease management companies should employ to incentive hospitals and physicians to improve quality and control costs. Researchers, for example, have documented that DRG based payments for physicians are statistically superior to DRG payments for hospitals. Table 7 contains the type of hospital information that health professionals and consumers of all types need to see today on a regular basis for all major hospital problems. The table presents information on cost or average charge, together with length of stay for patients with diabetes from a
nationwide data set. The data is adjusted for severity of illness and risk of mortality to ensure that comparisons are fair and equitable. Table 7, containing severity adjusted diabetes information with specific clinical information identifying why a patient might be in severity level 3, can be productively linked to both Table 6 (to understand whether a particular type of hospitalization can be linked to a decrement in severity of illness). In addition, the same information can be linked to Table 3 to identify a particular kind of patient particularly appropriate for either preventive care or intensive case management.

- Using data on both mortality and length of stay, providers can address quality improvement, as an excess of either mortality or length of stay almost certainly indicates an excess of avoidable complications. Tables 8 and 9 contain information relevant to disease management entities. Table 9 documents the fact that the hospital basically breaks even in the lower severity of illness levels but loses money on its congestive heart failure patients at the highest level of severity.
Table 7 – Severity Adjusted, National Diabetes Data

<table>
<thead>
<tr>
<th>Subclass</th>
<th>%Count</th>
<th>Sev Index</th>
<th>Avg. LOS</th>
<th>Avg Charge</th>
<th>%Count Mortality Risk</th>
<th>% Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>17.8</td>
<td>4.78</td>
<td>$9,443</td>
<td>29.6</td>
<td>6.98</td>
<td>6.98</td>
</tr>
<tr>
<td>Moderate</td>
<td>48.5</td>
<td>5.76</td>
<td>$11,864</td>
<td>23.2</td>
<td>15.61</td>
<td>15.61</td>
</tr>
<tr>
<td>Major</td>
<td>23.8</td>
<td>6.97</td>
<td>$17,770</td>
<td>32.6</td>
<td>29.94</td>
<td>29.94</td>
</tr>
<tr>
<td>Extreme</td>
<td>9.9</td>
<td>12.10</td>
<td>$35,289</td>
<td>14.6</td>
<td>76.63</td>
<td>76.63</td>
</tr>
</tbody>
</table>

Table 8 – Severity Adjusted Net Income Per Case, Congestive Heart Failure
Table 9 returns the focus explicitly to quality with the new set of hospital quality indicators, well documented for validity, recently released by the Agency for Healthcare Research and Quality (AHRQ). These indicators use claims data and are risk-adjusted for differences in complexity to ensure an “apples-to-apples” comparison. As public and private quality initiatives, such as the AHRQ, are increasingly using risk adjustment methodologies that are open to examination, this represents another reason disease management companies need to consider standardizing their data using risk adjustment methodologies with similar properties.

Table 9 – Sample HCUP Indicators developed by the Agency for Health Care Quality

<table>
<thead>
<tr>
<th>AMI Mortality</th>
<th>Number of risk adjusted deaths per 100 discharges for AMI</th>
<th>Future work; patient satisfaction/other outcome measures at 6 months post discharge</th>
<th>Future work; return to work measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF mortality</td>
<td>Risk adjusted deaths per 100 CHF discharges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip Fracture mortality (#36)</td>
<td>Risk adjusted deaths per 100 hip fracture discharges</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subhead: Why Action Has Not Been Taken and Conclusions

While the tools critical to narrowing care variation exist, the key to successful implementation of a strategy for improving quality while stabilizing costs rests at least in part with the disease management industry, that part of the health care sector that
concentrates on the most expensive and difficult to manage patients. The disease management community needs to identify leaders in the payer community who:

- Commit to working with the disease management entity on quality improvement and purchasing care based on value (quality/cost) for each type of health care encounter. In documenting to the payer the monetary value of coordinating care, disease management can help mitigate the current payer trend of shifting costs to the individual consumer.

- Want to work with payers to, once they have valid data, collaboratively work with health care organizations/professionals and purchasers responsible for the quality and cost services they provide.

- Appreciate the key role of consumers in quality improvement. Of all the health care organizations, it is the effective disease management entities of all types that appreciate the key role that consumers play in every aspect of coordinated care.

This appreciation leads to the inexorable conclusion that all Americans must have a minimum “floor” of health care coverage. Without this coverage, disease management companies, from a purely selfish financial perspective, will begin to see erosion in their market as employers begin to drop coverage, sick individuals will be unable to purchase individual insurance, and Medicaid programs will continue to cut back on benefits and individuals eligible for coverage.

It is much easier for segments of the disease management community to claim dramatic successes based on “secret sauces”. With such an attitude, the disease management movement could easily suffer the same fate that has befallen many parts of the managed
care industry. This article has tried to document the validity of the premise that it is far better for the long-term viability of the disease management movement to use transparent methodologies useful to all parties to the health care dinner table. They should be used not only to document quality of care and cost effectiveness of their programs but, just as importantly, for the sharing of financial and quality of care risk with all customers ranging from themselves to all parties to the health care table including patients, providers, payers.

Note: Disease management is very difficult to define in today’s rapidly changing health care environment. For the purposes of this paper I define disease management as any effort to coordinate care for patients with a chronic illness. A range of entities from a medical group, stand-alone disease management company to an MCO can coordinate this care. The actual service can cover a wide spectrum of services including telephonic case management to care provided directly in the home. The acceptance of financial risk may occur depending on what entity does the disease management.

The information presented and opinions expressed in this paper are those of the author and do not necessarily represent the views of 3M Health Information Systems or 3M Company. References for this paper can be obtained by emailing the author at nigoldfield@mmm.com