# Patient-Centered Medical Home Performance Metrics for Employers

**Patient-Centered Primary Care**
COLLABORATIVE

*www.pcpcc.net*

# Acknowledgments

# Dear Colleagues:

For decades, employers have been among the first to test the waters in new health care design, implementing creative employee benefit structures in an effort to improve the value of health care delivered to employees—in effect, to balance the quality and cost equation. In recent years, many employers have embraced advanced primary care models and the patient-centered medical home (PCMH) in their latest efforts to improve value; some employers are successfully linking value-based benefit design in those innovative programs. This practice is illuminated in the Patient-Centered Primary Care Collaborative's (PCPCC) 2010 white paper, Aligning incentives and systems: Promoting synergy between value-based insurance design and the patient-centered medical home.

While many case examples and a number of well-designed evaluations have measured the outcomes of these efforts, a structured and scalable metrics set that allows employers to evaluate the impact of these programs has been lacking. And although robust efforts are now underway to measure the overall impact of the medical home using patient clinical outcomes and cost or utilization indicators, these also lack the capability to measure other aspects of vital importance to employers, such as the effects on absenteeism, "presentee-ism" and employee productivity.

This report is an effort to address that gap. It puts forward a set of health and productivity metrics that can be used by employers and their supplier partners in several ways. Using the information presented here, employers can gain a comprehensive understanding of the value of health to employers and can put to use a set of metrics that allows comparison of programs from employer to employer. The goal is that, by using this common metrics set, employers will disseminate their own achievements in a comparable, understandable way and, in future years, more employers will be able to make the case for PCMH implementation.

This document is the work product of the PCPCCs Center for Employer Engagement. It is primarily authored by Bruce Sherman, MD, FCCP, FACOEM, co-chair of that Center and consulting corporate medical director for the Whirlpool Corporation. The PCPCC is greatly indebted to Dr. Sherman for his expertise and many volunteer hours dedicated to bringing together the research and thoughtful analysis this report represents. Through a careful description of metrics categories used by employers, a business-oriented timeline for understanding those metrics, and a collection of eight detailed case studies, it puts forward both the thinking behind use of the PCMH in benefit design and examples that demonstrate its effectiveness. We encourage you not to miss Dr. Sherman's discussion of metrics in the context of the case examples, as well as his concluding thoughts on how businesses should move forward.

Of course, we expect introduction of this measurement set to spur lively discussion. We look forward to engaging further in this dialogue with you.

Sincerely,

**John B. Crosby, JD**
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*    Executive Director of the*
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# Executive Summary

As private and public employers strive to improve workforce health and control healthcare costs, the patient centered medical home (PCMH) is emerging as an important strategic component to achieve these goals. The PCMH enables clinicians to deliver better quality care more efficiently. Central attributes of the PCMH include a holistic, team-based approach to primary care that is accessible, coordinated, and comprehensive. PCMH incorporates re-engineering of office processes and payment systems to reward an ongoing primary care physician-patient relationship and high-quality, coordinated care. Through better information management, use of guidelines and coordinated care, PCMH can contribute to better quality of care, which, in turn, drives cost reductions through avoided hospitalizations and emergency department visits.

While employer interest in PCMH continues to rise, an important issue facing employers concerns the measurement of value of PCMH implementation. From a pragmatic perspective, this information is necessary to help justify initial and ongoing employer investments in PCMH. And despite this observation, there is no consensus regarding specific measures or metrics to evaluate PCMH program effectiveness.

Further complicating the issue is the fact that employers tend to focus on healthcare costs, with less attention directed to the impact of poor health on absence and work productivity. These latter elements may represent an even greater cost to employers than healthcare costs alone. Consequently, PCMH implementation may well result in even greater employer savings than simply reducing healthcare expenditures.

In this white paper, authors from the Patient-Centered Primary Care Collaborative, the Integrated Benefits Institute, and Thomson Reuters present the conceptual foundation for different categories of metrics and their role in evaluating PCMH program implementation from an employer perspective. Metrics categories in the discussion include: population health, healthcare utilization and costs, absence, presenteeism, patient satisfaction/experience, and patient involvement in self-care. A discussion of a relative timeline for observing the impact of PCMH on these metrics is also included.

In a case study format, the white paper next presents the PCMH performance metrics that a series of private and public employers are each considering or using for evaluation of their respective PCMH programs. Featured employer case studies include:

- Boeing
- Whirlpool Corporation
- Calhoun County, MI
- Roy O. Martin Lumber Company
- Comprehensive Health Services
- QuadMed/QuadGraphics
- State of New York
- Merck

As perhaps its most important component, and following the case studies, the white paper provides a listing of recommended performance metrics for employers who are considering or have implemented a PCMH program. These metrics can be used to better understand the potential for PCMH program implementation, in addition to evaluating PCMH impact.

The recommended metrics reflect the elements of the so-called "Triple Aim," characterized as the optimal focus for healthcare system reform. The three objectives include improving the experience of care, improving the health of populations, and reducing per capita costs of health care. A fourth "Aim" has been included—improved workforce productivity—to represent an additional anticipated and meaningful outcome of better workforce health. Employers can appreciate that their use of the provided metrics therefore reflects a broad-based approach to healthcare system improvements. Physicians, too, may benefit from a review of this document, in order to better understand the business value of health, and the potential impact of improvements in healthcare delivery.

Through the use of these metrics, employers can gain a better understanding of the value of proposed or current investments in PCMH, and become even more knowledgeable purchasers of healthcare services.

While there is increasing interest in the patient-centered medical home (PCMH) as a means to provide higher quality healthcare, it has been challenging for employers to adopt PCMH offerings for their employees and family members. Several factors likely contribute to this difficulty. First, individual employers may not believe they have the critical mass of covered lives to impact community medical practice patterns. Second, funding for program start-up can be significant. Third, lack of clarity regarding optimal payment models and benefit design in support of PCMH have yet to be developed. Fourth, they don't know what kinds of improvements in health, in health outcomes, and in costs they can expect. Lastly, while health plans have generally recognized the potential value of PCMH, the need for favorable outcomes from plan-specific PCMH pilot programs appears to have contributed to delays in more widespread PCMH implementation.

One of the major barriers for employer-driven PCMH implementation is that there has been no consensus on what metrics should be used for quantifying the value of PCMH from the employer perspective. Many of the current metrics focus on utilization and quality measures. Recently, use of electronic medical records and patient registries has facilitated the incorporation of clinical laboratory values into program evaluation. Unfortunately, while addressing clinical care concerns, none of these metrics incorporate parameters that quantify a broader measure of value for employers.

Research shows that incorporating PCMH into the healthcare delivery system decreases healthcare utilization and costs in several settings (1). Implementation success, however, has largely been viewed through the lens of reduced healthcare utilization due to more effective use of preventive care measures and chronic condition management. Clinical and cost metrics have been used to quantify the impact of these programs relative to baseline data or control populations. While there is likely significant overlap among the clinical measures currently in use, there is a need to identify a set of standard metrics that can help to quantify the value of PCMH for employers.

Healthcare utilization and costs are important considerations to employers in establishing the value of any health-related program offering. Equally important, however, are measures of employee absence and health-related performance (which has been termed "presenteeism" in the healthcare research literature) and the productivity improvements that result. Research has shown that productivity loss associated with absence and presenteeism lost time represent a significant proportion of the total cost of poor health to employers—two to three times the incurred medical cost (2). Thus, the impact of these additional outcomes of poor health is of sufficient magnitude to stimulate greater employer interest in corrective interventions, including PCMH. Furthermore, if employers can better understand the potential value of PCMH as an approach that can improve the health and productivity of the workforce while decreasing healthcare expenditures, employers may become more effective advocates for PCMH implementation..

The metrics described in this document reflect the elements of the so-called "Triple Aim," which has been characterized as the optimal focus for healthcare system reform (3). As stated, these three objectives include: improving the experience of care (access, quality, and reliability); improving the health of populations; and reducing per capita costs of health care. Employers can appreciate that their use of the provided metrics reflects a comprehensive approach to healthcare system improvements. In addition, employers should take note that a fourth "Aim" has been included in the metrics noted below—improved workforce productivity—to represent an additional anticipated and meaningful outcome of better workforce health.

The goal of this white paper is to outline a set of health and productivity metrics that can be used by employers and their supplier partners in several ways. First, they can be used to help employers better understand their healthcare and lost productivity cost drivers, establish an employer baseline from which to track changes over time and help evaluate the potential opportunity for PCMH implementation. These metrics will help benefits personnel better understand the potential sources of value resulting from PCMH implementation and empower them to more effectively quantify the overall business impact of workforce health.

Second, for employers implementing PCMH, these metrics can be used to evaluate program success in a broader context than simply healthcare costs alone. The importance and magnitude of the productivity impact of health has been well established, and inclusion of these metrics will yield a more comprehensive under-standing of the business value of health. Accordingly, employers can use health and productivity metrics to-gether to help evaluate the effectiveness of PCMH on the health and performance of their workforce.

Third, a standard set of metrics will facilitate comparison of the experiences of different employers. The details of current PCMH metrics tracking vary by employer, making it somewhat difficult to compare the results of differ-ent PCMH programs. Additionally, data can be used to identify and facilitate dissemination of best practices.

In the future, aggregate reporting of these metrics over time may serve as a benchmark for employers that are contemplating PCMH implementation to quantify the potential business value and timeline for success.

Finally, PCMH experience data may be used by employ-ers that are contemplating a gain-sharing approach with their insurance or other health benefits vendors to engage either their insurance beneficiaries, involved clinicians, or both. One the demand side, employers may contemplate a value-based insurance design with their PCMH offering, with co-pay reductions or waivers to incentivize PCMH use. On the supply side, employers may consider outcomes-based contracting (4) as part of their performance strategy. Other uses for the data may come to light as data are collected and aggregated.

# Metrics Categories

Employers typically have relied on healthcare suppliers to provide metrics related to healthcare delivery. For most, data have been used to quantify eligibility, utilization, quality, costs, and cost-sharing. The data have provided comparisons for benchmarking and trend analysis. In increasing numbers, employers are expanding their understanding of population health data—including health risk and chronic condition prevalence and costs, preventive care compliance and medication adherence—to identify opportunities for targeted population health management program implementation. Many of these same employers are using data to understand the potential impact of incorporating value-based benefit design, to lower financial barriers to employee and family member utilization of high-value healthcare services.

Because of the growing burden of healthcare costs for employers, and particularly for new health benefits offerings, it is not surprising that employers are demanding objective return on investment (ROI) measures for these programs. While often provided (principally by program vendors), the lack of a consistent approach to evaluating program impact has generated uncertainty among employers. Furthermore, given the focus on costs, measurement of an ROI analysis to address the cost-containment needs for employers is understandable, but fails to get at the more substantial business value that also includes reductions in lost work time and increased work output. Without a clear understanding of the potential health and productivity value of health management programs, employers may be reluctant to invest any more resources in an already costly area.

For employers considering or already involved in PCMH implementation, a thorough understanding of the categories of employer metrics can help clarify, both objectively and systematically, the value of this strategic approach to health delivery. Before characterizing the use of these metrics in employer case studies, it is appropriate first to describe the general categories of metrics available for employer use and their relevance to evaluating the business impact of PCMH implementation.

## a. Population health profile

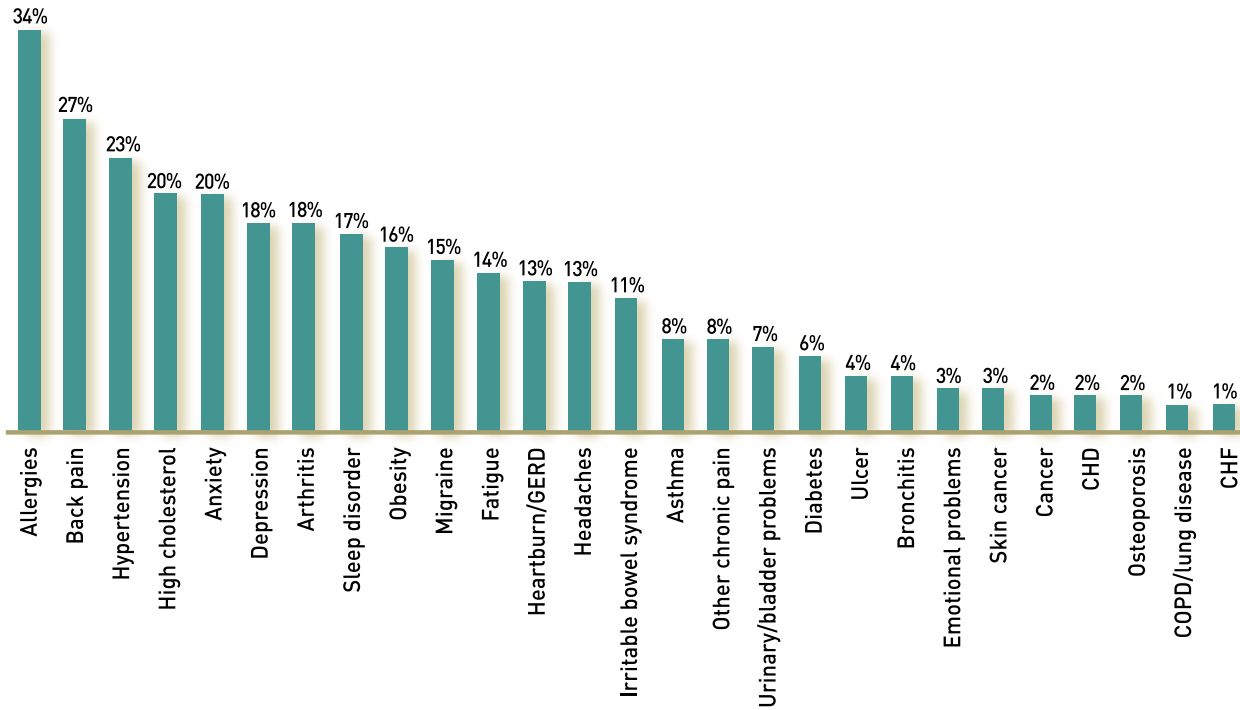There are two types of clinical information that employers can use to better understand the health of their employees and family members. First, a population health profile can provide insight into chronic disease prevalence. Although, by itself, this information may not appear to have immediate relevance to PCMH program implementation, it can certainly highlight guide employer selection of health program interventions to address identified population health issues. Medical treatment is unlikely to appreciably change the prevalence of these chronic conditions, but can certainly impact severity and duration.

A second type of clinical information, the population health risk profile is dynamic and reflects the prevalence of health risks and unhealthy lifestyle behaviors. These data are most often collected through the use of health risk assessments and can be used to evaluate and manage individual health risks and co-morbidities. More importantly, these data can provide an understanding of population health concerns as a focus for lifestyle behavior management programs. In the setting of PCMH, these data have utility to demonstrate the impact of the PCMH practitioner's care team on individual and population-level improvements in lifestyle behaviors. Since healthcare costs are associated with the number of population health risks (5), it follows that a reduction in the number of risks will result in a decline in healthcare expenditures. Accordingly, health risks can be considered as a leading indicator of future healthcare costs.
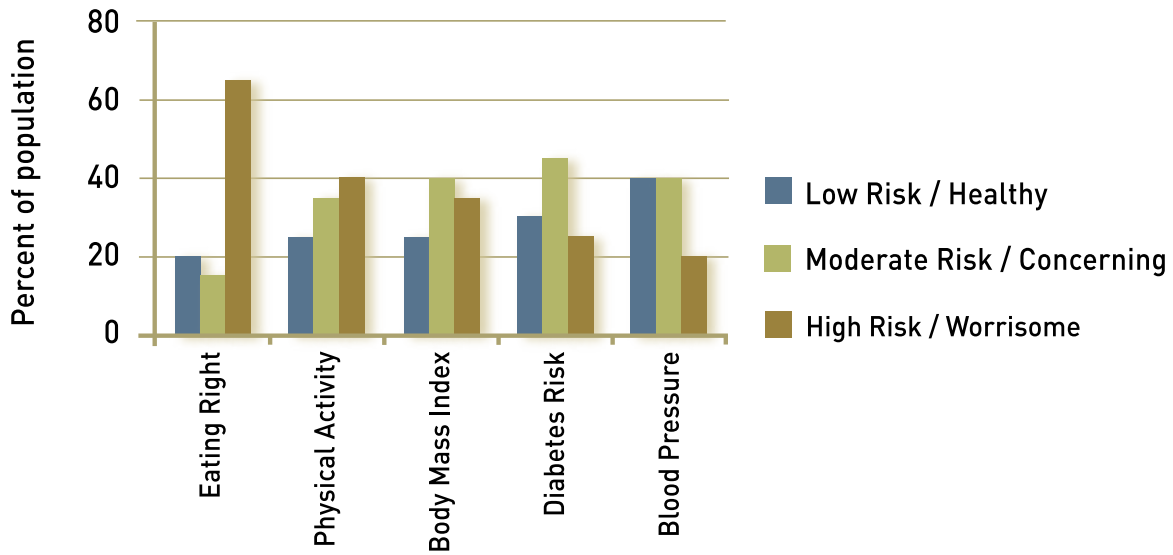
## b. Healthcare utilization

At a population-health level, healthcare utilization data can provide insight into the relative distribution of healthcare services use. Benchmark data from broader populations generally are necessary to provide a basis for interpretation of employer-specific data. For example, the significance of hospitalization rates or emergency department use may be difficult to appreciate in the absence of benchmark data from a larger representative population. Importantly, healthcare utilization data are the cornerstone for measuring and evaluating preventive care services use, such as colon and breast cancer screening (as shown in Figure 3, see page 6), or disease-specific preventive care, such as diabetic eye examinations. Healthcare utilization data are useful in tracking the employer's own trend over time, in that a reduction in use of acute, high-cost services, including emergency department visits and hospitalizations, likely indicates improved chronic condition management.

**Figure 1.** Chronic condition prevalence in an employee population. (Source, Integrated Benefits Institute, 2009. Used with permission.)



**Figure 2.** Representative population health risk profile providing stratification of identified health risks.

For employers, healthcare utilization data can be used to establish the effectiveness of strategies to use appropriate services, such as preventive care, and identify opportunities for intervention to improve suboptimal utilization rates. Data also can provide insight into overuse of healthcare services in comparison to evidence-based guidelines as a means to improve the quality and efficiency and cost-effectiveness of care delivery.
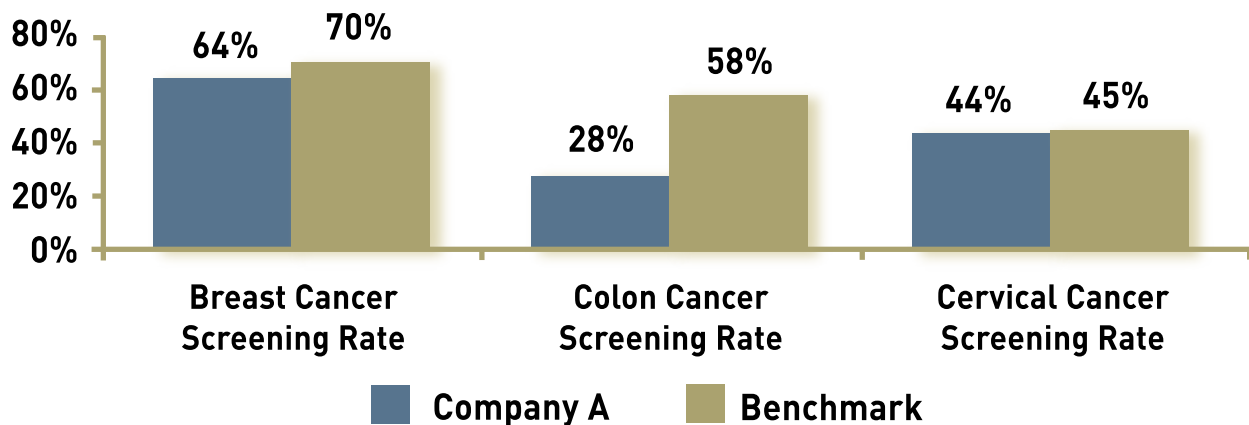
Measures of healthcare utilization represent a central element in the evaluation process of PCMH implementation. As perhaps the most fundamental measure, individual use of PCMH services is perhaps the most critical metric because, without utilization, there is no likelihood of PCMH program success. Utilization of other healthcare services can draw attention to compliance with preventive care services, as well as compliance with disease-specific preventive care, such as eye exams for those with diabetes. Importantly, utilization data can be used to evaluate the effectiveness of PCMH in controlling chronic disease, as reflected by emergency department and hospitalization use.

### c.  Clinical measures and outcomes

Currently, a range of existing clinical measures are in widespread use by health plans, and include established quality measures from the Health Effectiveness Data Information Set, commonly known as HEDIS measures (6). These measures typically are provided at an aggregate, physician or practice-specific level, and as a result, typically do not provide meaningful detail or actionable information for employers. Additionally, these data often are compared to "book of business" or other benchmark data, which provide a less than optimal comparator, since they may not incorporate age, gender, or regional factors that impact results. Most of these metrics originate from medical or pharmacy claims data, and thus, primarily reflect utilization of services and not the underlying health of the population covered. So used, claims data yield a modest estimate of quality and provide even less of a measure of treatment outcomes or effectiveness.

For example, the NCQA Diabetes Provider Recognition Program threshold values for diabetes management have established the following criteria in figure 4, below.

## *Preventive Services - Goal:  To exceed benchmark*



**Figure 3.** Representative utilization data; comparison of preventive care screening rates with national benchmark data. (Source: Thomson Reuters MarketScan® Used with permission.)

For the employer, the ability to provide evidence-based recommendations for blood glucose control for only 40% of diabetes patients, blood pressure control for only 25% of patients, and LDL cholesterol control for only 36% of patients should not be viewed as satisfactory. The use of these existing metrics as sole measures of healthcare outcomes risks shifting the focus of attention away from a more comprehensive view of the value of healthcare delivery.

Employers actively involved with or considering PCMH implementation should evaluate the current healthcare metrics available to them. Existing health plan-provided metrics represent a starting point for evaluation, but a more comprehensive assessment of PCMH program implementation will need to include a broader set of measures, as described below.
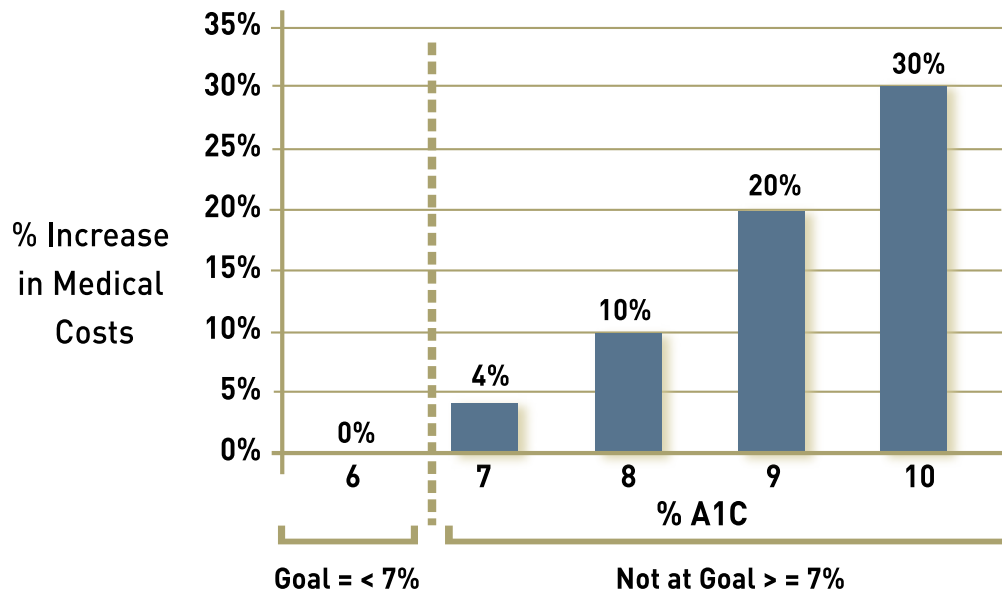
The ability to determine if individuals have been treated to evidence-based medical treatment goals is one attribute that is regularly missing from current administrative claims information. Key goals may include achieving a blood pressure to 120/80 or less, weight loss of a particular magnitude, or reduction of lipid profile to acceptable levels. While some health plans have access to these data elements, most do not. This limitation significantly curtails the evaluation of treatment effectiveness. These data also are critical in guiding clinician decision-making on the need for intensification of therapy.

Individuals treated to therapeutic goals are able to reduce their risk of disease-specific complications and have lower healthcare costs (1). For example, diabetics in the Asheville project had a considerably lower rate of diabetes-related complications, including amputations, blindness and kidney failure (7). As shown in Figure 5, more effective treatment of diabetes was associated with lower healthcare costs during a three year period (8). As a result of effective condition management, employers can benefit from cost savings, both in the near term (reduced symptoms and fewer acute minor complications) and in the long-term (avoidance of major complications). For PCMH programs, these data elements are most often documented in an electronic medical record

| Criteria | Standard |
|---|---|
| **Blood glucose (HbA1c) control** | |
| HbA1c < 7.0% | 40% of patients |
| HbA1c > 9.0% (poor control) | < 15% of patients |
| | |
| **Blood pressure control** | |
| BP > 140/90mmHg (poor control) | < 35% of patients |
| BP < 130/80mmHg | 25% of patients |
| | |
| **Cholesterol control** | |
| LDL > 130mg/dL (poor control) | < 37% of patients |
| LDL < 100mg/dL | 36% of patients |
| | |
| Eye exam | 60% of patients |
| Foot exam | 80% of patients |
| Nephropathy assessment | 80% of patients |
| Smoking status and cessation advice or treatment | 80% of patients |

**Figure 4.** Representative healthcare performance standards: NCQA threshold criteria for the Diabetes Provider Recognition Program. (Source: NCQA 2010.)

**Figure 5.** Relationship between diabetes control and adjusted healthcare costs during the subsequent three years. (Adapted from Gilmer TP et al. Diabetes Care, 1997.)

or patient registry. Additional data may be available through employer-sponsored biometric screening, health coaching or condition management programs. Retrieval of clinical outcomes documentation from paper medical records, though possible, is time-consuming, costly and inefficient. These data are vital for evaluation of patient outcomes, particularly where performance-based payments are involved. Current PCMH measurement efforts have focused on prevalent chronic conditions, including diabetes, hypertension, as well as elevated cholesterol. In addition, they have focused on identified health risks, including weight, body mass index, and smoking status.

PCMH practices can use clinical outcomes measures at the individual patient level to guide clinical care decisions to achieve desired treatment goals. In aggregate form, practices can use the data to identify areas for focus, including patient education and practice-based performance improvement efforts. Importantly, these metrics likely represent the basis for performance-based care management payment incentives for PCMH practices.

#### d. Healthcare costs
Healthcare costs are perhaps the most familiar measure for employers because of the impact on operating margins. Healthcare costs are a direct consequence of healthcare utilization, which, in turn, results in large part from the prevalent acute

and chronic health conditions in the population. High-level cost reporting (such as total inpatient payments) reflects aggregate employer expenditures; a more detailed interpretation of cost data (such inpatient payments for specific diseases) can be quite difficult in the absence of detailed healthcare utilization information. While essential for establishing budgets and benefit design strategies, *cost data should be viewed by employers as a consequence of healthcare utilization, which is a consequence of population health.* Careful attention to identified health concerns will result in improved condition management, yielding more effective cost management.

Another approach to analyzing cost data is to characterize healthcare expenditures for individuals in cost bands. This method can help to identify the number of individuals with no medical claims, who have received no care and are also not using preventive services. Additionally, these data often highlight the disparities in healthcare expenditures among individuals. In the example shown in figure 7, 8.9% of the claimants are responsible for 62.1% of total healthcare costs.
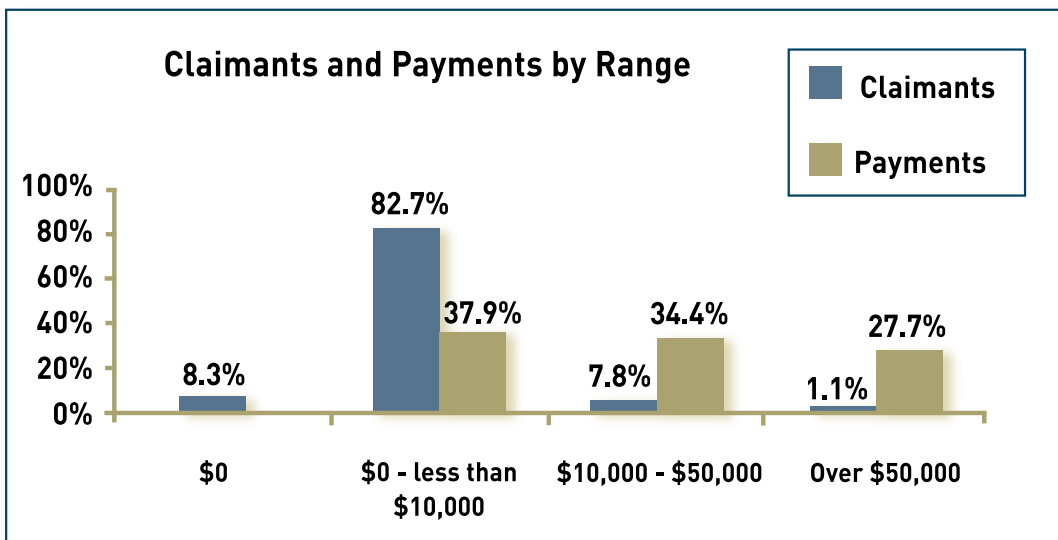
Healthcare cost is a major concern for employers either contemplating or implementing PCMH programs. Use of cost metrics to establish a baseline as well as

| 2. COSTS | | | | | |
|---|---|---|---|---|---|
| **Per Member Per Month** | Jul 2008 –<br>Jun 2009 | Jul 2009 –<br>Jun 2010 | %<br>Change | Recent<br>Norm | Comp to<br>Norm |
| **Inpatient Cost** | $95.28 | $98.85 | 3.7% | $83.97 | 17.7% |
| **Outpatient Cost** | $101.74 | $114.19 | 12.2% | $87.40 | 30.7% |
| **Physician's Office Cost** | $68.76 | $68.54 | -0.3% | $69.66 | -1.6% |
| **Prescription Drug Cost** | $57.47 | $56.33 | -2.0% | $64.70 | -12.9% |
| **All Other Cost** | $38.89 | $38.53 | -0.9% | N/A | N/A |
| **Total Cost** | $362.14 | $376.44 | 3.9% | $344.74 | 0.2% |
| **Other – Allow Amt ER** | $9.23 | $13.31 | 44.2% | $13.31 | 0.0% |
| **Favorable to Norm** | | **Comparable to Norm** | | **Unfavorable to Norm** | |

| 3. COST DRIVERS | | | | | |
|---|---|---|---|---|---|
| **Metric** | Jul 2008 –<br>Jun 2009 | Jul 2009 –<br>Jun 2010 | %<br>Change | Recent<br>Norm | Comp to<br>Norm |
| **Inpatient** | | | | | |
| **Allow Amt Per IP Day** | $4,086 | $4,945 | 21.0% | $4,513 | 0.6% |
| **IP Days Per 1,000** | 279 | 239 | -14.3% | 219 | 0.6% |
| **Outpatient** | | | | | |
| **Allow Amt For OP Fac Visit** | $831 | $815 | -1.9% | $881 | -7.4% |
| **OP Fac Visits Per 1,000** | 1,468 | 1,680 | 14.4% | 1,191 | 41.1% |
| **Physician** | | | | | |
| **Allow Amt Per Office Visit** | $136 | $134 | -1.8% | $137 | -2.5% |
| **Office Visit Per 1,000** | 6,050 | 6,142 | 1.5% | 6,089 | 0.9% |
| **Rx** | | | | | |
| **Allow Amt Per Rx Script** | $87 | $84 | -3.9% | $94 | -11.0% |
| **Scripts PMPY** | 7.9 | 8.0 | 2.0 | 8.2 | -2.2% |
| **Other** | | | | | |
| **Allow Amt Per ER Visit** | $477 | $686 | 43.7% | $867 | -20.9% |
| **ER Visits Per 1,000** | 232 | 233 | 0.4% | 184 | 26.6% |
| **Favorable to Norm** | | **Comparable to Norm** | | **Unfavorable to Norm** | |

**Figure 6.** Representative reporting of employer healthcare expenditures. (Source: Thomson Reuters MarketScan® Used with permission.)



**Claimants and Payments by Range**

- $0: Claimants 8.3%
- $0 – less than $10,000: Claimants 82.7%, Payments 37.9%
- $10,000 – $50,000: Claimants 7.8%, Payments 34.4%
- Over $50,000: Claimants 1.1%, Payments 27.7%

**Figure 7.** Representative example of population healthcare costs by individuals distributed by cost categories. (Source: Thomson Reuters MarketScan® Used with permission.)

evaluate ongoing program effectiveness is an essential component, but as stated, healthcare costs result from utilization of health services. As a result, the impact of PCMH on healthcare utilization patterns will determine the associated healthcare cost outcomes. Accordingly, managing costs in the absence of utilization data, such as hospitalization and emergency department visit rates, is therefore an undesirable approach.

### e. Productivity—absence

Employers are coming to appreciate the business impact of employee absence. Workers who are absent do not generate business revenue and often are paid wage-replacement payments during the period they are away from work. Temporary or overtime personnel may be needed to replace a missing worker, not infrequently at a greater cost than the absent employee. Furthermore, these replacement workers may produce substandard work due to their lack of familiarity with their temporary roles, further adversely impacting revenue generation. All of these attendant costs of absence can be considered lost productivity costs because the employer no longer has these financial resources available to invest in more productive endeavors. In addition, employee colleagues who fill in for the missing worker may feel frustration and resentment, contributing even more to reduced work output. Of note, employees may not be absent for their own illness; they may also need to stay home to care for a sick family member.
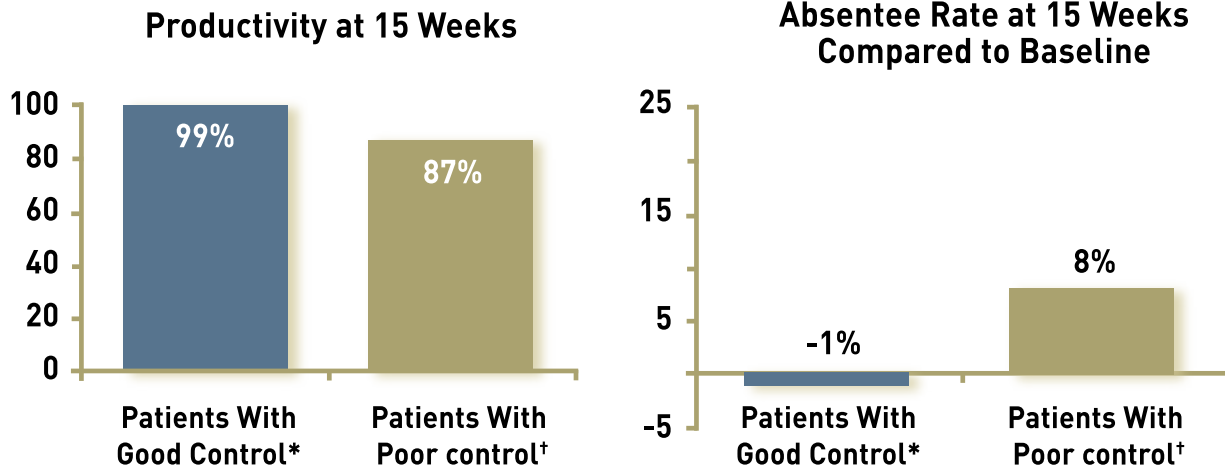
Illness-related absence comprises an estimated 70.6% of all employee absence (9). Suboptimal control of chronic conditions can significantly increase the likelihood and the duration of employee absence; while improved management of chronic conditions has been shown to decrease absence (10). Accordingly, lost work days are an important measure of the business value of poor health. While virtually all employers have a payroll system, not all have a time and attendance system to permit accurate tracking and measurement of absence, except, perhaps, for short- and long-term disability. Employers contemplating PCMH implementation may want to evaluate their current capabilities for tracking these data to ensure that employee absence is accurately recorded.
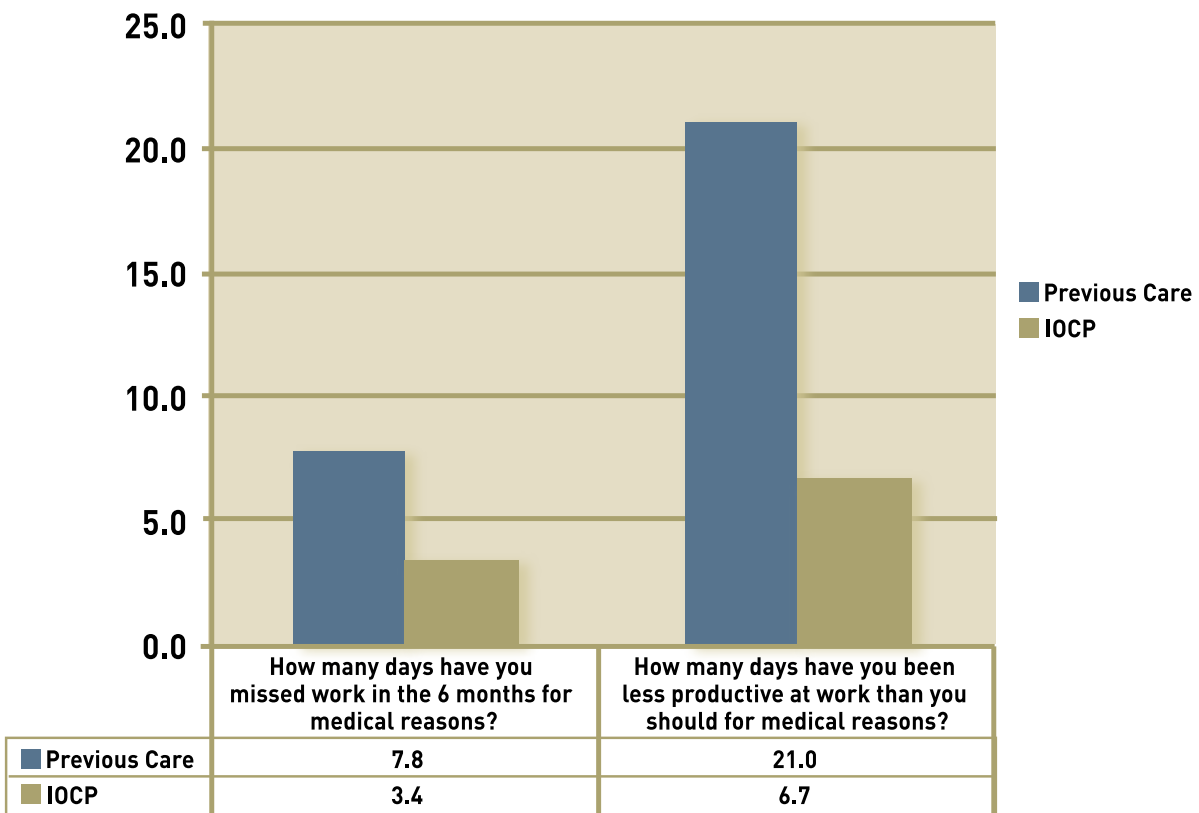
### f. Productivity—presenteeism

Employees who are at work but not functioning at their full capacity because of health issues are manifesting presenteeism—that is, reduced job performance associated with poor health. This is particularly a common problem for those with chronic conditions. Reduced performance is typically is measurable through use of validated employee self-reporting, such as the HPQ/HPQ-Select, WLQ, WPAI and others. The reduced performance scales are typically translated in lost time from work which can then be quantified as lost productivity. Numerous studies provide convincing evidence of the impact of presenteeism on productivity for both health risks (1), as well as selected chronic conditions (2).

Although intuitively evident, and despite seemingly ample supporting literature, use of presenteeism lost productivity in evaluating the business outcomes of health-related programs has not achieved widespread employer use. Nonetheless, employers that have incorporated presenteeism lost productivity into their reporting structure may want to consider longitudinal measurement of this measure as part of their PCMH evaluation process. For example, in the Boeing PCMH program, a significant reduction in presenteeism was noted (10), as shown in Figure 9.

## Productivity at 15 Weeks



## Absentee Rate at 15 Weeks Compared to Baseline



**Figure 8.** Workplace presenteeism and absenteeism after 15 weeks in diabetics with good vs. poor disease control. (Adapted from Testa MA. JAMA, 1998.).



| | How many days have you missed work in the 6 months for medical reasons? | How many days have you been less productive at work than you should for medical reasons? |
|---|---|---|
| Previous Care | 7.8 | 21.0 |
| IOCP | 3.4 | 6.7 |

**Figure 9.** Workplace presenteeism and absence before and after PCMH implementation. (Source: Milstein A, Kothari P. Are higher value healthcare models replicable? Health Affairs blog, October 2009.)

### g.  Total health and productivity costs

In addition to healthcare costs, the inclusion of lost productivity costs associated with absence and presenteeism provide a more comprehensive view of the total cost of poor health and facilitate a more thorough understanding of the business value of health interventions. The two charts in figure 10 illustrate the claims-only evaluation of annual health costs, as well as the relative contributions of both health and productivity-related costs for ten chronic conditions, generated through a combination of multiple data sets. A comparison of the two charts can provide significant insight into condition-specific contributions to both health and lost productivity costs.

### h.  Patient experience and satisfaction with healthcare services

While a direct link between patient satisfaction and business value may not readily be apparent, favorable measures of satisfaction with the healthcare system can be reasonably anticipated to result in less employee distraction, and therefore, greater work productivity. In so far as employers are involved in the determination of benefit design and clinician networks, employees and their family members may appreciate the role of employers in supporting their access to high-quality, patient-centered services. Accordingly, improvements in patient satisfaction may well be of at least qualitative value for employers.
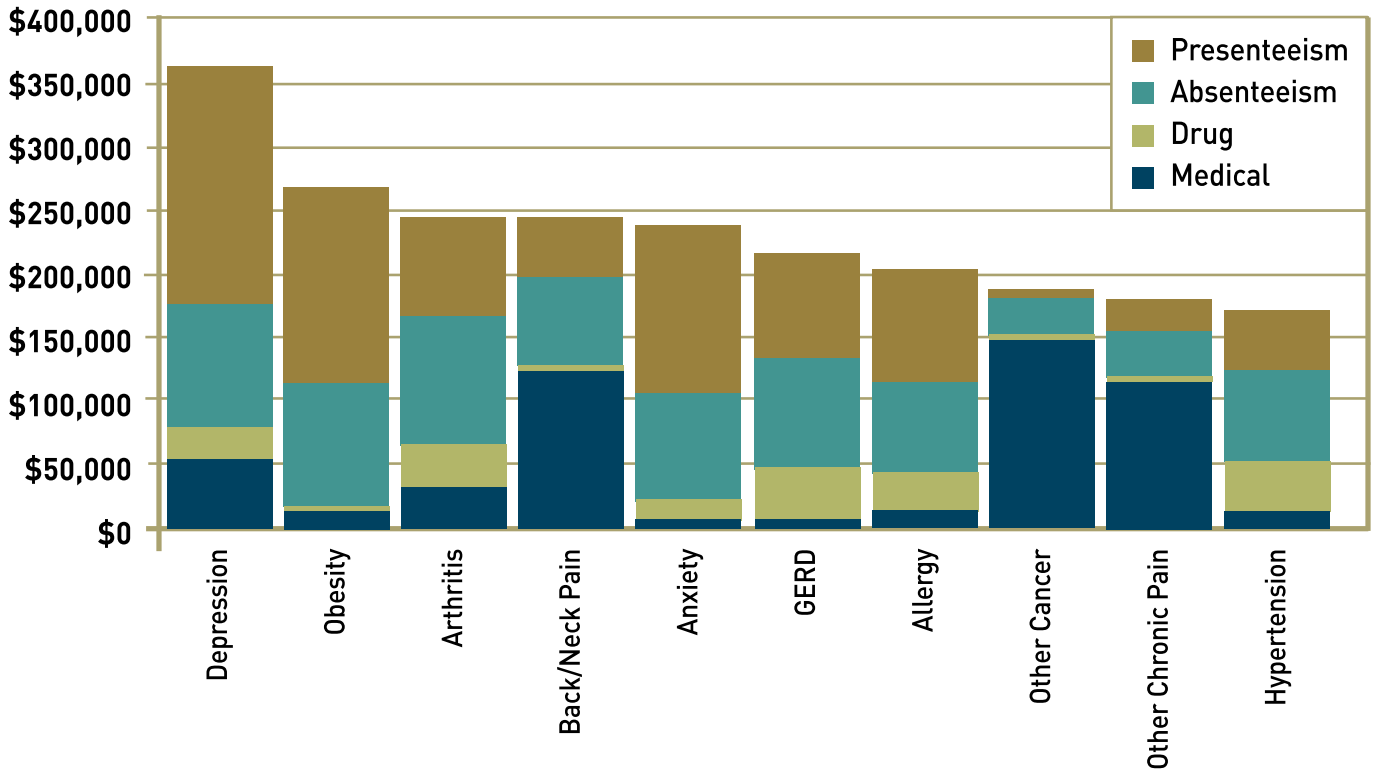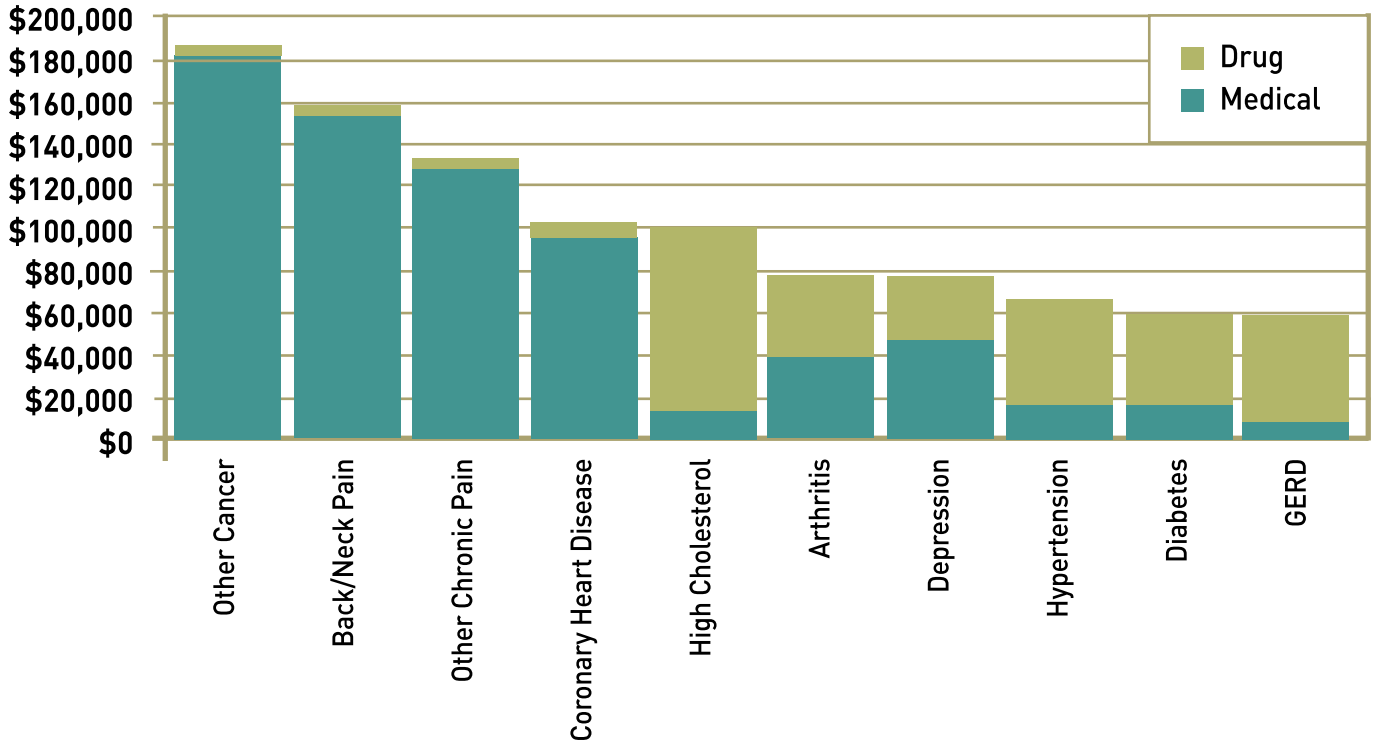
Patient satisfaction data may not be readily available to employers. However, if the health plan is collecting patient experience data, this information may be available upon employer request. It seems commonplace that PCMH program implementations have included patient satisfaction measures as part of the evaluation process. Reports from recent studies have shown increased levels of patient satisfaction with this care delivery model (13). Therefore, employers involved with PCMH care for their beneficiaries may want to ensure that aggregate reporting on patient satisfaction is available to them as another measure of the effectiveness of care delivery.
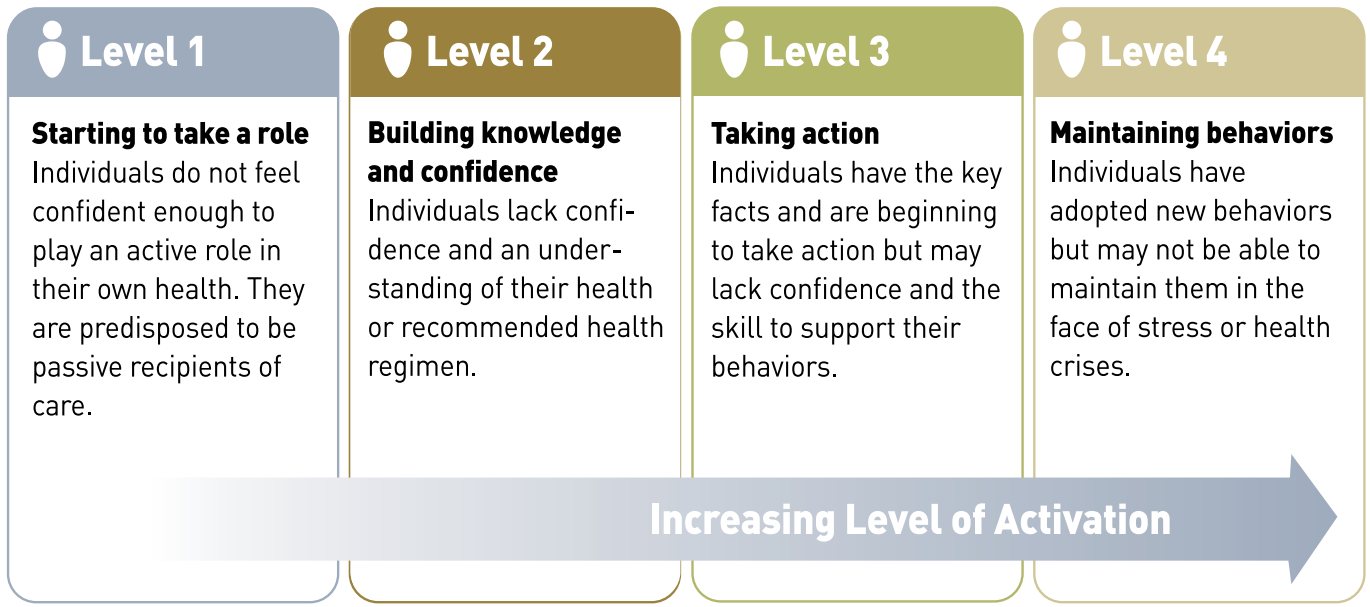
However, for satisfaction survey data to be meaningful, it should be collected using a valid survey instrument, such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey (14). Development of a survey to study the impact of PCMH on patient satisfaction is currently underway. It also is important to appreciate that patient experiences with care may reflect issues beyond their interaction with the clinician, such as parking, waiting room time, or other issues, and should not be viewed as a proxy for the quality of care.

### i.  Employee engagement in self-care (patient activation)

For many who access healthcare, the clinician-patient interaction is effectively a one-way communication by the physician following the patient's description of a medical concern. This approach, while perhaps perceived as efficient by practitioners, unfortunately does not effectively engage, or activate patients to become more involved and responsible participants in their own care.

**Figure 10.** Top. Medical and pharmacy costs for four employers. Bottom. Total health and productivity costs for four employers. Data derived from multiple sources, using metrics similar to those described in this white paper. (Adapted from Loeppke RJ. Occup Environ Med, 2009.)

| **🧍 Level 1** | **🧍 Level 2** | **🧍 Level 3** | **🧍 Level 4** |
|---|---|---|---|
| **Starting to take a role** Individuals do not feel confident enough to play an active role in their own health. They are predisposed to be passive recipients of care. | **Building knowledge and confidence** Individuals lack confidence and an understanding of their health or recommended health regimen. | **Taking action** Individuals have the key facts and are beginning to take action but may lack confidence and the skill to support their behaviors. | **Maintaining behaviors** Individuals have adopted new behaviors but may not be able to maintain them in the face of stress or health crises. |

**Increasing Level of Activation** ➜

**Figure 11.** Stages of patient activation. (Source: Judith Hibbard, PhD. Used with permission.)

An important goal of PCMH implementation is to facilitate greater patient involvement in self-care. Survey tools have been developed that assess an individual's knowledge, skills and confidence integral to managing his/her own health and healthcare, known by many as patient activation, the process of which is shown in figure 11 (15). While not a standard component of current data collection efforts, and as one such measurement tool, the Patient Activation Measure™ can also provide valuable insight into the effectiveness of the clinical care team's ability to more actively involve individuals in their care. Experience with such measures is expanding, and in the setting of PCMH, measurement of patient activation can likely demonstrate the value of PCMH relative to the current care delivery system.

### j. Other metrics categories
There are undoubtedly other metric categories that employers may find of value in their analysis of whether to adopt PCMH. These include, and are not limited to, job and benefits satisfaction, employee engagement with the organization, and customer satisfaction. These measures likely reflect on the broader business impacts of improved employee health, and the association with workforce health has not been fully characterized.

### k. Summary of metrics categories
The table below is a compendium of the categories of metrics characterized above, including respective data sources. This compilation may help to evaluate the various metrics categories with respect to their utility and value to employers.

| Metrics category | Data origin/Employer data source |
|---|---|
| Population health profile | Health risk assessment and medical claims |
| Healthcare utilization | Medical /pharmacy claims |
| Healthcare costs | Medical/pharmacy claims |
| Clinical measures and outcomes | Lab test results, clinician office measurements |
| Productivity – absenteeism | Absence tracking or payroll |
| Productivity – presenteeism | Self-reported employee surveys |
| Total health and productivity costs | Aggregate of healthcare costs and lost productivity value |
| Patient satisfaction | Clinician office or third-party originated survey (CAHPS) |
| Patient engagement in self-care (activation) | Clinician office or third-party originated survey (self-reported) |

# A Business Timeline Context for Understanding Metrics

The list of provided metrics can create some uncertainty with respect to interpretation. One way to provide perspective is to frame these in the context of the timeline for anticipated changes in the values of individual metrics. Leading (process) indicators reflect early manifestations of PCMH implementation, including PCMH office visits and patient satisfaction with service delivery. Intermediate indicators reflect clinical outcomes and patient involvement in self-care, while lagging (outcomes) indicators reflect the meaningful healthcare cost and

productivity metrics. As shown in the table below, these metrics are separated based on the relative time frame for anticipated improvement, though there may well be an overlap for some metrics. For example, reduced absence and presenteeism may occur as a result of improved diabetes control in a matter of weeks, as shown in Figure 8, above. Clearly, an understanding of all metrics at the start of PCMH program implementation is important, to provide insight into the particular population health concerns and healthcare and lost productivity cost drivers.

| Leading indicators | Intermediate indicators | Lagging indicators |
|---|---|---|
| Healthcare utilization (PCMH) | Healthcare utilization (preventive care and non-PCMH services) | Healthcare costs |
| Patient experience and satisfaction | Clinical outcomes | Absence |
| Medication adherence | Population health and health risk profile | Presenteeism |
| | Patient activation | Total health and productivity costs |

## Case Studies

The following case studies include employers who have started down the path of PCMH implementation for their employees and family members. Each example provides information about the population of program participants, as well as the clinical setting where the program is implemented. The metrics identified by each employer or employer group for evaluating the PCMH program are listed, along with the specific data sources for each of the identified data elements.

| Employer name | Boeing |
|---|---|
| Number of participating patients | 740 non-HMO enrollees, including active employees, dependents, and pre-65 retirees. Selected on the basis of chronic disease severity (10%-20% of enrollees with predicted highest cost) |
| Number and location of PCMH practices | Three primary care medical group practices in the Seattle area |
| Practice technology characteristics and data collection capabilities | Varies by practice, with either paper or electronic medical records |
| Employer data collection capabilities | Medical and pharmacy claims; patient surveys for physical/mental functioning (SF-12 and PHQ-9), productivity and absence data |
| Evaluation methodology | Comparison to a propensity-matched control group of non-participants |
| Metrics and data sources | Medical claims<br><br>• Population health profile<br>　i.　Disease burden and diagnoses<br>　ii.　Body mass index<br>• Utilization<br>　i.　HEDIS measures for heart disease, hypertension, diabetes<br>　ii.　Hospitalizations<br>　iii.　Hospital days<br>　iv.　Emergency department use<br>　v.　Lab utilization<br>　vi.　Radiology utilization<br>• Costs<br>　i.　Total medical and pharmacy<br>　ii.　Hospitalization<br>　iii.　Emergency department<br>　iv.　Hospital admits<br>　v.　Outpatient visits – primary care and specialist<br>　vi.　Lab<br>　vii.　Radiology<br><br>Pharmacy claims<br><br>• Utilization<br>　i.　Generic prescribing rate (not vs. control group)<br>• Costs<br>　i.　Prescription costs<br>　ii.　Prescription days dispensed<br><br>Clinical outcomes<br><br>• Laboratory data<br>% individuals with HbA1c <7<br>% individuals with LDL cholesterol <100<br>• Biometric measures<br>% individuals with systolic BP<140 mmHg |

**Continued:**

| | | |
|---|---|---|
| Metrics and data sources (continued) | **Productivity metrics** | |
| | • Self-reported productivity (absenteeism/presenteeism)<br>  Work days missed in prior 6 months due to poor health<br>  At-work health-related productivity impairment | |
| | **Patient surveys** | |
| | • Functional status (SF-12 physical and mental functioning scores)<br>• Depression screening (PHQ-9)<br>• Satisfaction (Ambulatory Care Experiences Survey) | |
| Outcomes data | Two Year Change in Combined Total Per Capita Health Care Spending, Functional Health Status, Patient Experience, and Absenteeism | |
| | | % Difference |
| Healthcare costs/person | % change from baseline in unit price-standardized total annual per capita spending by patients and Boeing | −20%* |
| Average SF12 physical functioning score | % change in SF12 physical functioning score for IOCP patients compared to baseline | +14.8% |
| Average SF12 mental functioning score | % change in SF12 mental functioning score for IOCP patients compared to baseline | +16.1% |
| Patient satisfaction | % change in patient-rated care "received as soon as needed" compared to baseline** | +17.6% |
| Lost productivity | % change in average of patient-reported work days missed in last 6 months compared to baseline | −56.5% |

\* $p = 0.11$ after first 12 months for 276 chronically ill enrollees vs. 276 matched controls, net of care management fees to medical groups.
\*\* From the Ambulatory Care Experience Survey – patients responding "always" or "almost always" to the question: "When you needed care for illness or injury, how often did the IOCP provide care as soon as you needed it?"

Source: Milstein A, Kothari PP. Are Higher-Value Care Models Replicable? Health Affairs blog. October 20th, 2009. Accessed at: http://healthaffairs.org/blog/2009/10/20/are-higher-value-care-models-replicable

| Employer name | Whirlpool Corporation |
|---|---|
| Number of participating patients | Approximately 1800 |
| Number and location of PCMH practices | 42 physicians in 14 offices in Findlay, OH |
| Practice technology characteristics and data collection capabilities | Common patient registry in all practices |
| Employer data collection capabilities | Data warehouse for medical/pharmacy/vision claims, biometric screening data, practice registry, and patient satisfaction surveys as data sources. |
| Evaluation methodology | Comparison to a propensity-matched control group of non-participants, as well as pre-post implementation comparisons |
| Metrics and data sources | Medical claims

- Utilization
    i.   Hospitalization rates
    ii.  Emergency department use rate
    iii. Primary care utilization rate
    iv.  Quality care measures for diabetes, HTN, COPD/asthma
    v.   Compliance with preventive care utilization rates
- Costs
    i.   Medical costs, including emergency department visits, inpatient admits, and specialty care costs for each disease state

Pharmacy claims

- Utilization
    i.   Medication adherence rates for diabetes, hypertension, COPD/asthma
- Costs
    i.   Pharmacy costs

Clinical outcomes

- Laboratory data
  % individuals with HbA1c <7,<8, and <9
  % individuals with lipid profile improvement
- Biometric measures
  % individuals with BP in control (<134/85 mmHg)
- Other measures
  % individuals with asthma using asthma rescue inhaler
  <2 days per week |
| Outcomes data | Pending |

| Employer name | Calhoun County – City of Battle Creek, Kelloggs, Kellogg Foundation, Stewart Industries, Battle Creek Health System |
|---|---|
| Number of participating patients | 12,000 in PCMH practices |
| Number and location of PCMH practices and physicians | 14 practices , 30 physicians in Calhoun County, >50% of all primary care clinicians |
| Practice technology characteristics and data collection capabilities | Common registry, with approximately a 70% EHR adoption rate for PCPs |
| Employer data collection capabilities | Claims data collected by health plan |
| Evaluation methodology | Pre-post implementation trending |
| Metrics | Diabetes<br><br>• Diabetic foot exam rate<br>• Diabetic retinal exam rate<br>• % of patients with HbA1c  <7%<br>    o  Goals: comparison to HEDIS rates<br><br>Cardiovascular disease<br><br>• % with blood pressure <130/80<br>    o  Actual compared with HEDIS rates and Healthy People 2020; and trend<br>• LDL <100 in at risk populations (heart disease, diabetes)<br>    o  Actual compared with HEDIS rates, and Healthy People 2020; and trend<br><br>Preventable Hospitalizations<br><br>• rate of preventable hospitalizations for congestive heart failure and diabetes<br><br>Ethnic Disparities<br><br>• Gap in diabetes and heart disease care disparities for above metrics<br><br>Cost<br><br>Medical trend – year-over-year cost per employee<br>Rx trend – year-over-year cost per employee<br>Disability trend – year-over-year cost per employee<br><br>Participation rates<br><br>Health risk assessment – employee participants/total eligible<br>Intervention participation – employee participants/total eligible<br><br>Considered for later implementation<br><br>Weight loss<br>Education<br>Coaching<br>Participation - three year<br>Engagement - three year<br><br>Population Health Risk Profile<br><br>% low risk (% with 2 or fewer risks)<br>% medium and high risk<br>% low risk and remaining low risk<br><br>Productivity<br><br>Absentee days<br>Presenteeism<br><br>Clinical from claims data<br><br>Health risk score |
| Outcomes data | Pending |

| Employer name | Roy O Martin Lumber Company, LLC and Gilchrist Construction |
|---|---|
| Number of participating patients | Roy O Martin = 1050 individuals; Gilchrist = 750 individuals |
| Number and location of PCMH practices | One location centrally located in Alexandria, LA. |
| Practice technology characteristics and data collection capabilities | EMR used, along with access to medical/pharmacy claims data and case management vendor data. |
| Employer data collection capabilities | Health plan housing aggregate claims data. EMR capturing clinical data. Kiosk in clinic for patient feedback. |
| Evaluation methodology | Over-time trending of population health measures/metrics, with ROI based in part on clinic vs. community cost analysis. |
| Metrics and data sources | Medical Claims |

Medical Claims

- o Utilization
  - ER
  - Specialty
  - Diagnostic
- o Costs
  - Primary Care
  - ER
  - Specialty
  - Diagnostic
- o Severity of Diagnosis
  - We should see decrease in severity of issue because the patient is receiving the right care at the right time
  - We should see less claims with severe diagnosis codes within existing population

Pharmacy claims

- o Increase in compliance
- o Decrease in costs

Clinical Outcomes

- o Using evidence based guidelines, evaluate all chronic patients to ensure compliance

Physician-Specific Metrics

- Are the correct tests being performed at the right time
- Are appropriate medications being prescribed
- Are follow up notes being taken showing contact with patient

Patient-Specific Metrics

- Are appointments being kept
- Is medication being taken properly
- Is the patient responding to care coordinator calls
- Is patient compliant with diet/exercise regime as outlined

Clinic-Specific metrics

- Is care coordinator following up with patient
- Are records being reviewed for outside clinic visits
- Are all results logged
  - o Yearly HRA's to document overall health improvement in population
  - o Satisfaction Surveys
    - Utilization of the clinic increasing over time

Absenteeism will be tracked going forward; no capability to measure it in the past.

| | |
|---|---|
| Outcomes data | Pending |

| Employer name | Comprehensive Health Services |
|---|---|
| Number of participating patients | approximately 5,000 |
| Number and location of PCMH practices | 3 practices at different employer locations |
| Practice technology characteristics and data collection capabilities | EMR collects all encounter data, interfaces with lab vendor to store results in patient record.  HRA questions are part of patient intake, with biometrics and patient responses integrated in to the EMR. |
| Employer data collection capabilities | Data warehousing of medical and pharma claims,  some laboratory data and most HRA data |
| Evaluation methodology | Trend analysis and comparison of risk adjusted cohorts using different metrics including PMPY cost and EBM compliance measures |
| Metrics and data sources | Cost/Compliance metrics: |

Cost/Compliance metrics:

    1. EBM compliance
      a. A total of 54 conditions available, with two included below as representative examples
      b. Diabetes (sample of 26 rules)
        i. Patients with 2 HbA1c tests in past 12 months
        ii. Patients with annual screening for diabetic nephropathy
      c. Hypertension (sample of 13 rules)
        i. Patients compliant with medication (ACE, diuretic, beta blocker, etc.)
        ii. Patients with annual physical
    2. Episode Risk Grouper for risk adjustment – Retrospective risk score generally between 1.2 and 1.8
    3. PMPY cost (allowed amounts)
    4. Risk adjusted PMPY (Episode Risk Grouper applied to PMPY to compare clinic user versus non user)

Other metrics:

    1. Risk Cohort (high, medium, low based on risk factors)
    2. Provider visit rate PMPY
    3. ER visit rate PMPY
    4. Admit rate PMPY
    5. Rx  utilization PMPY

Clinical Metrics:

Diabetes (sample)
    1. HbA1C < 7%
    2. LDL < 100mg/dl
    3. BP < 130/80
Asthma (sample)
    1. Spirometry – based on age/sex/stature
    2. Peak flow – based on age/stature
    3. Influenza vaccination status
Hyperlipidemia (sample)
    1. Lipid panel fasting - Dependent on ATP III guideline
    2. BMI < 25
    3. BP < 140/90
Hypertension (sample)
    1. BP < 130/80 (high risk); < 140/90 (low risk)
    2. BMI < 25
    3. Lipid panel fasting - Dependent on ATP III guideline

| | |
|---|---|
| Metrics and data sources (continued) | **Preventive Metrics:** |
| | **Physical Activity (sampling of measures)** 1. BMI < 25  2. BP < 140/90  3. Min of mod cardio 30 min/ 5 days per week OR min of intense cardio 20 min/ 3 days per week  **Weight Management (sample)**  1. BMI < 25  2. Waist circumference – men < 40", women < 35"  3. Body composition (fat %) – men < 25%, women < 30% |
| | Other clinical metrics exist for: <br> 1. CAD  2. COPD  3. CHF  4. Vascular disease  5. Osteoarthritis  6. GERD  7. Metabolic syndrome  8. Pre diabetes  9. Low back pain  10. Stress management  11. Nutrition  12. Tobacco cessation |
| Outcomes data | Increased compliance rates with evidence-based medicine noted year over year.  In addition, established patients show better disease-specific compliance rates with lower associated risk-adjusted costs (average of 17% for same diseases). |

| **Employer name** | **Merck** |
|---|---|
| Number of participating patients | 800 in New Jersey |
| Number and location of PCMH practices | 425 practices in New Jersey |
| Practice technology characteristics and data collection capabilities | Physician organization managing care coordination and data collection/ distribution |
| Employer data collection capabilities | Data collection/management vendor |
| Evaluation methodology | Comparison with baseline data and evidenced-based guidelines |
| Metrics and data sources | Medical Claims |
| | • % of diabetics getting at least one HbA1c test per year <br> • % with values less than 7 <br> • % with values between 7 and 9 <br> • % with values greater than 9 <br> • % diabetics getting at least one LDL test per year <br> • % with values less than 100 <br> • average MPR of for adherence to diabetic medications <br> • blood pressure values <br> • % diabetics getting annual eye exam <br> • % diabetics getting annual foot exam <br> • PMPM total health care costs per diabetic (both pharmacy and medical costs) |
| Outcomes data | Pending |

| Employer name | QuadGraphics/QuadMed |
|---|---|
| Number or patients | Nearly 20,000 |
| Number and location of PCMH practices | Six locations - Saratoga Springs, NY; Martinsburg, WV;  Lomira, WI;  Sussex, WI;  Hartford, WI;  West Allis, WI; each with a broad range of healthcare staff |
| Practice technology characteristics  and data collection capabilities | All sites except one use the same EMR for medical services.  Clinics have a secure messaging system for communicating with patients. QuadMed uses a software program which can generate patient letters and provide real-time clinical dashboard metrics for providers. The clinics also collect patient satisfaction data. |
| Employer data collection capabilities | The data warehouse includes data from QuadMed and non-QuadMed patients.  Payroll data on absenteeism, Workers Compensation data, and disability data are also collected but are currently not integrated into the data warehouse. |
| Evaluation methodology | Comparison of clinical and claims data to data warehouse normative values, best practices, and regional, national benchmarks and guidelines. Comparison of users vs. non-users; over-time trend analysis. Evaluation of specific interventions and programs. |
| Metrics and data sources | Cardiovascular Disease |
| | Diagnosis of CAD or CAD risk equivalent (>20% 10 year event risk)<br>  1. Cholesterol control<br>    a. Percent with good control (<100)<br>    b. Percent with fair control (>100 and <130)<br>    c. Percent with poor control (>130)<br>    d. Percent untested<br>  2. Cholesterol testing<br>    a. Percent of patients who were tested in past measurement year<br>  3. Use of aspirin<br>Diagnosis of CHF<br>  1. In addition to CAD, use of ACE inhibitor medication or angiotensin receptor blocker medication; use of beta blocker |
| | Diabetes |
| | Diagnosis of Diabetes<br>  1. Global measurement<br>    a) Percent of patients who have had all three of the following<br>      i. Two Hemoglobin A1c tests performed during the 12 month reporting period – And<br>      ii. One LDL-C cholesterol test performed during the 12 month reporting period – And<br>      iii. One kidney function test during the 12 month reporting period, and/or diagnosis and treatment for kidney disease<br>  2. Blood pressure<br>    a) Percent with most recent BP reading  >/= 130/80<br>  3. Hemoglobin A1c (A1c)<br>    a) Testing rates<br>      i. Percent with two A1c tests within the past measurement year<br>    b) A1c control in the measurement period.<br>      i. Percent with good control (less than 7.0%)<br>      ii. Percent with fair control (greater than or equal to 7.0% and less than or equal to 9.0%)<br>      iii. Percent uncontrolled (greater than 9.0%)<br>      iv. Percent who were not tested<br>  4. Kidney disease<br>    a) Percent screened and/or monitored for kidney disease in the measurement year |

| Metrics and data sources (continued) | 5. Cholesterol<br>   a. Cholesterol control<br>      i. Percent with good control (<100)<br>      ii. Percent with fair control (>100 and <130)<br>      iii. Percent with poor control (>130)<br>      iv. Percent untested<br>   b. Cholesterol testing<br>      i. Percent of patients who were tested in past measurement year<br>6. Misc- flu vaccine rates, monofilament rates, eye exam rates, foot exam rates, smoking cessation counseling. |
|---|---|
| | Uncomplicated hypertension |
| | Diagnosis of Essential Hypertension without diabetes, chronic kidney disease, end-stage kidney disease, and/or congestive heart failure<br>  1.  Percent with BP less than 140/90 mm Hg |
| | Asthma |
| | Diagnosis of Asthma<br>  1. Percent with flu vaccine, having a written asthma plan, spirometry testing |
| | Measurements for Preventive Care |
| | 1. Tobacco:<br>   a. Percent of individuals age 18 to 85 years of age who have documentation in their medical record that they were asked about tobacco use status at a health care encounter during the 12-month measurement period.<br>2. Pneumococcal vaccination:<br>   a. Percent of adults greater than or equal to 65 years who had a pneumococcal vaccination<br>3. Mammogram:<br>   a. Percent of women age 50-74 who have had at least one mammogram within the previous 24 months.<br>4. Cervical Cancer Screen:<br>   a. Percent of women age 21-65 who have had at least one cervical cancer screening tests during the previous 36 months<br>5. Colorectal cancer screening:<br>   a. Percent of adults age 50 and older who have had one of the following<br>     • Fecal occult test in the past year (or)<br>     • Sigmoidoscopy in past 5 years (or)<br>     • Colonoscopy in past 10 years<br>6. Osteoporosis:<br>   a. Percent of women age 65 or older who have had a bone density measurement |
| Outcomes data | Costs are approximately 25% less per employee and member in the QuadMed system compared to community-provided healthcare.<br>Quality indicators are generally higher, with greater utilization of out-patient services and lower rates of emergency department and hospitalization rates.<br>Patient satisfaction rates are generally higher. |

| Employer name | State of New York |
|---|---|
| Number of participating patients | 16,200 [Note that this employer is one of many in a considerably larger multi-stakeholder PCMH initiative in the Adirondack region] |
| Number and location of PCMH practices | Approximately 100 |
| Practice technology characteristics and data collection capabilities | Electronic medical record in use by all practices. Patient survey (CAHPS); Clinician survey (American College of Physicians) |
| Employer data collection capabilities | Payor aggregating claims data; electronic medical record data sent to third party, which is aggregating data and generating reports |
| Evaluation methodology | Over-time trending from baseline |
| Metrics and data sources | (Metrics reflect a blend of clinical information from the EMR, as well as claims data. Note that the list below is a representative sampling. Furthermore, staged incorporation of additional metrics is planned.)<br><br>Diabetes:<br><br>Hemoglobin A1c (HbA1c)<br>    i.  Percent of patients receiving one or more HbA1c test<br>    ii.  Percent of patients with most recent HbA1c level >9.0%<br>    iii.  Percent of patients with most recent HbA1c level <=8%<br>    iv.  Percent of patients with most recent HbA1c level <=7%<br>Lipid<br>    i.  Percentage of patients receiving at least one low-density lipoprotein cholesterol (LDL-C) test<br>    ii.  Percent of patients with diagnosis of diabetes (DM) with LDL-C < 100 mg/dl from last test done<br>    iii.  Percent of patients with DM with LDL-C >= 130 mg/dl from last test done<br>Urine<br>    i.  Percentage of patients receiving at least one nephropathy assessment (microalbumin/creatinine ratio, a 24 hour urine for microalbuminuria, timed urine for or spot urine for microalbuminuria or positive urinalysis for protein)<br>Blood Pressure<br>    i.  Percent of patients with most recent systolic blood pressure <130 mm/Hg AND diastolic blood pressure <80 mm/Hg, measurement period<br>ER Visits<br>    i.  Number of ER visits of patients with diagnosis of DM and discharge diagnosis diabetes related during measurement period<br>ER Visits (Trend)<br>    i.  Number of ER visits of patients with diagnosis of DM and discharge diagnosis diabetes related during measurement period and previous period (trend)<br>Admissions<br>    i.  Number of admissions of patients with diagnosis of DM and discharge diagnosis diabetes related during measurement period<br>Admissions (Trend)<br>    i.  Number of admissions of patients with diagnosis of DM and discharge diagnosis diabetes related during measurement period and previous period (trend)<br>Cost of Admission<br>    i.  Median cost of admission of patients with diagnosis of DM and discharge diagnosis diabetes related during measurement period |

| Metrics and data sources (continued) | Hypertension: |
| --- | --- |
| | **Hypertension control**<br>  i.  Percent of patients with most recent systolic blood pressure >= 140 mm/Hg OR diastolic blood pressure >= 90 mm/Hg |
| | Coronary Artery Disease (CAD): |
| | **Lipid**<br>  i.  Percentage of patients with a Dx of CAD and receiving at least one low-density lipoprotein cholesterol (LDL-C) test<br> ii.  Percent of patients with Dx of CAD with LDL-C < 100 mg/dl from last test done, over measurement period<br>**Hypertension Control**<br>  i.  Percentage of patients who had a diagnosis of CAD with most recent systolic blood pressure >= 140 mm/Hg OR diastolic blood pressure >= 90 mm/Hg |
| | Pediatrics – Prevention: |
| | **Lead Screening**<br>  i.  Percentage of patients with at least one blood lead screening test at 24 months of age<br>**Obesity**<br>  i.  Percentage of children over 2 years of age and less than 18 years of age who have had at least one height and weight taken upon visit with BMI calculated during measurement period |
| | Pediatrics – Obesity: |
| | **Obesity Screening**<br>  i.  Percentage of patients who had height and weight taken upon visit with BMI calculated during yearly measurement period<br>**Obesity Treatment**<br>  i.  Percentage of patients receiving medical evaluation if BMI greater than or equal to 85th percentile; Testing - blood pressure measurement, HbA1c, lipid profile, fasting glucose. |
| | Pediatrics – Asthma: |
| | **Appropriate Medications**<br>  i.  Percentage of patients ages 5 - 18 years who have asthma who are on appropriate medication (inhaled corticosteroids or Singulair) |
| | Pharmacy: |
| |   i.  Generic Utilization Rate<br> ii.  Total Pharmacy Spend<br>iii. Formulary Adherence |
| | Claims-Based Measures: |
| |   i.  Emergency Room Utilization<br> ii.  Emergency Room Utilization for 'Ambulatory Sensitive' Conditions<br>iii. Inpatient Utilization<br>iv. Inpatient Utilization for 'Ambulatory Sensitive' Conditions<br> v.  Specialist Utilization<br>vi. Radiology Utilization<br>vii. Total Spend<br>viii.Total Costs for Certain Conditions<br>ix. Total Surgical Procedures<br> x.  Readmissions |
| Outcomes data | Pending |

## Case studies: General observations regarding metrics

For most employers, the metrics in use for evaluating PCMH programs reflect a common interest in the triple aim of improved quality, better outcomes, and lower total healthcare costs. Broadly speaking and shown in the examples above, quality measures are focused on compliance with evidence-based treatment and preventive care services. Outcomes metrics are clinically focused, and generally reflect, an interest in chronic condition management to identified target goals. Health care cost metrics include total costs, as well as the use of utilization metrics to identify the specific sources of cost savings, including hospitalizations and emergency department use.

The identified metrics related to quality, outcomes and cost are quite similar among the different employer programs. These metrics reflect anticipated findings from the transformation in the delivery of healthcare and, as such, may well have been selected by the medical stakeholders involved in the respective PCMH programs. This should not come as a surprise, because few employers have sufficient internal medical expertise to independently establish these types of clinical metrics.

However, the exclusion of employee productivity measures as metrics of critical importance to employers is eye-catching. As previously noted, research shows that individuals who are healthier are absent from work less often for medical reasons, and are more productive while at work (16). Studies have convincingly shown the relationship between health status and lost productivity (15, 17), with the business cost of lost productivity representing a relatively greater cost to employers than the medical treatment costs alone.

There may be several reasons for this observation. First, employers may not have the ability to track absence at a level or with the detail required for focused analysis. Some employers may not have a formal absence management program. Others may have paid-time-off programs and can't distinguish illness leave from vacation and holiday leaves. Still other employers may perceive that the effort and cost required to track absence exceeds the expected value. Perhaps the most common reason that absence is not included as a metric, however, is that most physicians do not consider absence as a measurable outcome of their treatment. Instead, absence seems to be a consequence of the treatment approach, the

employer's plan design and existence of a return-to-work program and employee motivation. Thus, they may see absence as simply beyond the scope of their care. Consequently, if physicians and other medical personnel are driving the metrics selection process, it is not surprising that absence does not hold importance compared to more familiar parameters.

Perhaps similarly, while two case studies have included presenteeism as an outcomes measure, this measure is similarly infrequently used. In addition to challenges with interpreting the business impact of reduced performance related to health, presenteeism requires a self-reported measurement approach beyond medical claims, patient registry, or electronic medical record sources. Furthermore, given that most presenteeism measurement tools accurately reflect a recall period of four weeks or less, it may be difficult to extrapolate the significance of the findings of a single survey to the entire evaluation period (18). With that said, despite the limitations of presenteeism measurement, results can at least provide more qualitative assessment of the value of PCMH implementation.

To help employers that do not have access to their own data on absence and presenteeism, and their relationship to lost productivity, the not-for-profit Integrated Benefits Institute (www.ibiweb.org) has constructed a variety of low-cost modeling tools for employers to "fill in the blanks" on each of these key dimensions. The Absence Cost Estimator can be used to predict sick-leave lost time and its lost productivity consequences. The Health and Productivity Snapshot provides modeled results on chronic health conditions, absence and presenteeism lost time and lost productivity. The Institute's Full-Cost Estimator provides corporate-level health and productivity estimates and maximizes the benefits program data the employer has available. All of these tools give employers good estimates of these dimensions and help build the business case for employer data collection in these areas.

Patient satisfaction scores appear regularly in these case studies. Since physicians have a vested interest to ensure that patients return for continued care to support their practice transformation, it is not surprising the patient satisfaction measures are high on their list. Employers have an interest in ensuring that employees and family members provide favorable satisfaction scores to support employer desired cost-saving goals.

For several reasons, many of the other metrics categories described above do not appear in these case studies. For example, knowledge of patient activation measures, while subject to increasing interest, is not widespread. Due to the clinical focus of PCMH implementation, greater attention is understandably directed toward medically-oriented metrics. Links between healthcare outcomes and other employer measures—such as overtime use, employee engagement, and other business-related measures—do not occur with great frequency. Consequently, it is no surprise that these metrics are viewed with less interest than the primary focus of the triple-aim objectives of quality, outcomes, and cost.

## Recommended employer metrics and data sources

The metrics provided in this section of the white paper are consensus recommendations based on the case studies presented here. Data for these metrics are typically available to employers. These metrics can be used by employers who are considering PCMH implementation, as well as those who have already implemented a PCMH program. Additionally, these metrics can be used independent of any medical home certification program in which PCMH physicians may have participated.

It is important to note that these metrics categories are appropriate for consideration by employers for any planned population health interventions that affect a critical mass of individuals. However, these metrics reflect a high-level view. Understanding the effectiveness of more specific interventions—such as a lifestyle management programs or disease-specific management programs—should include more detailed measures on each to provide a clearer understanding of program effectiveness and causal relationships.

Notably, these metrics can also be used as a basis for evaluation of value-based design strategies, to assess population health-level compliance with high-value services, such as disease-specific preventive care, or adherence to medications for chronic conditions.

| Metric Category | Metric | Description of Metric | Source of data for metric | Value to employer |
|---|---|---|---|---|
| **Population Health Profile** | | | | |
| i. Health risk prevalence | Rate = # individuals with a particular risk/total # HRA respondents | Measures the proportion of individuals who may be candidates for lifestyle management program interventions offered through the PCMH | Health risk assessment (HRA) | Over-time trending can provide a measure of PCMH program effectiveness in addressing lifestyle issues |
| iia. Chronic condition prevalence (claims data) | Rate = # individuals with a particular condition/ total # eligible beneficiaries | Measures the proportion of individuals who may be candidates for chronic condition management program interventions offered through the PCMH. | Medical claims | Provides both a rationale and a focus for PCMH program intervention, particularly if condition-specific medical costs are high. |
| iib. Chronic condition prevalence (HRA) | Rate = # individuals with a particular condition/total # HRA respondents | Measures the proportion of individuals who may be candidates for chronic condition management program interventions offered through the PCMH | Health risk assessment | Self-reported conditions often occur at a greater prevalence than what appears in medical claims data, indicating the proportion of individuals self-managing their conditions without medical support |

| Metric Category | Metric | Description of Metric | Source of data for metric | Value to employer |
|---|---|---|---|---|
| **Healthcare Utilization** | | | | |
| i. PCMH adoption | Rate = # enrolled in PCMH/total # eligible beneficiaries | Measures the number of beneficiaries who are enrolled in a PCMH benefit; tracking change over time | Eligibility file and medical claims to identify primary care clinician | Demonstrates effectiveness of enrollment marketing, education as to value of PCMH |
| ii. PCMH utilization | Rate = # visits to PCMH practices/total # PCMH enrollees | Measures the use of PCMH by PCMH enrollees. | Medical claims file | As a leading metric, trend data should demonstrate active use of PCMH by PCMH enrollees, and should likely be greater than non-PCMH primary care. |
| iii. Emergency department | Rate = # ED visits for PCMH pts with condition/total # PCMH pts with condition (can be calculated at population and patient level) | Measures ED utilization rate for identified chronic condition (i.e. asthma, diabetes, etc.). Goal is to see decrease over time as a result of improved care coordination and access; can be compared to non-PCMH enrollees. | Medical claims file | Demonstrates effectiveness of chronic condition management, and more appropriate use of healthcare resources. Also represents likely component of healthcare cost reduction. |
| iv. Hospitalizations (ambulatory care-sensitive) | Rate = # hospitalizations for PCMH patients with condition/total # PCMH patients with condition (can be calculated for individual conditions, or for all conditions, combined) | Measures the hospitalization rate for conditions that can be effectively managed as an outpatient, such as asthma, COPD, angina, diabetes, hypertension, and other conditions. Can be compared to non-PCMH enrollees. | Medical claims file | Demonstrates effectiveness of chronic condition management, with reduction in hospitalization rate. Demonstrates more appropriate use of healthcare resources. Represents a potentially significant component of healthcare cost reduction |
| v. Hospital readmissions | Rate = # PCMH patients readmitted for same condition within 30 days of discharge/# PCMH patients admitted for same condition | Measures hospital readmission rates for same condition within a pre-determined length of time for any condition | Medical claims file | Reflects continuity of care by PCMH, with fewer anticipated readmissions. Employees return to work sooner and demonstrate fewer long-term clinical issues; higher productivity |
| v. Preventive Care Services (general) | Rate = # PCMH patients receiving specific procedure(s)/total # PCMH patients in same population category | Measures the rate at which patients are receiving age- and gender-specific evidenced-based preventive care (including cancer screenings, immunizations, tests and/or medications). Can be compared to non-PCMH enrollees. | Medical claims file | Improved patient compliance results in earlier diagnosis of acute problems, avoidance of late complications, with less unplanned absence and improved productivity. Can be used to demonstrate trend over time. |

| Metric Category | Metric | Description of Metric | Source of data for metric | Value to employer |
|---|---|---|---|---|
| **Healthcare Utilization continued:** | | | | |
| vi. Preventive Care Services (disease-specific) | Rate = # PCMH patients with condition receiving evidence-based guideline care/total # PCMH patients with condition | Measures the rate at which patients with specific condition are receiving evidenced-based preventive care for their condition (such as Hemoglobin A1c and eye exams for diabetes). Can be compared to non-PCMH enrollees. | Medical claims file | Regular monitoring of chronic conditions improves condition management, keeping employees at work, with less unplanned absence and higher productivity. Can be used to demonstrate trend over time. |
| vii. Medication Adherence | Rate = # PCMH patients with medication adherence of 80% or greater / total # PCMH patients with same prescribed medication or medication class | Measures the rate at which patients are adhering to prescribed Rx treatment plan (either general or condition-specific). Can be compared to non-PCMH enrollees. | Medical and pharmacy claims files | Medication adherence is central to effective chronic condition management. Keeps employees at work more often; less unplanned absence and higher productivity. Can be used to demonstrate trend over time. |
| **Clinical Outcomes** | | | | |
| i. Treatment to target goals for chronic conditions | Rate = # PCMH patients at specific goal or better/ total # PCMH patients with condition | Measures the rate of condition-specific patients are obtaining targeted outcome goals (i.e. blood pressure <130/80, LDL <100, hemoglobin A1c <7.0 for diabetes, etc.) Can be compared to non-PCMH enrollees. | Medical claims file, and EMR or patient registry | Reporting of clinical outcomes demonstrates treatment effectiveness, resulting from successful patient/clinician collaboration. Improved outcomes keep employees at work more often, with less unplanned absence and higher productivity. Can be used to demonstrate trend over time. |
| **Healthcare Costs** | | | | |
| i. Total PCMH patient healthcare costs | Rate = Total medical and pharmacy costs for PCMH patients / # PCMH patients | Measures the average total healthcare cost for PCMH participants. Can be compared to cost data for non-PCMH enrollees. | Medical and pharmacy claims file | Improved management of health should result in lower total overall healthcare costs for PCMH participants, with reduced overall healthcare cost trend over time. |
| ii. Emergency department costs | Rate = Emergency department costs for PCMH patients / # PCMH patients | Measures average emergency department costs for PCMH participants. Can be compared to cost data for non-PCMH enrollees. | Medical and pharmacy claims file | Improved management of health should result in lower emergency department costs for PCMH participants, with reduced emergency department cost trend over time. |
| iii. Ambulatory care-sensitive hospitalization costs | Rate = Cost of condition-specific hospitalizations of PCMH patients / # PCMH patients | Measures the reduction in hospitalization costs for ambulatory care-sensitive conditions such as asthma, COPD, angina, diabetes, hypertension, UTI, ruptured appendix, etc. Can be compared to cost data for non-PCMH enrollees. | Medical and pharmacy claims file | Improved management of health should result in lower hospitalization costs for PCMH participants, with reduced hospitalization cost trend over time. |

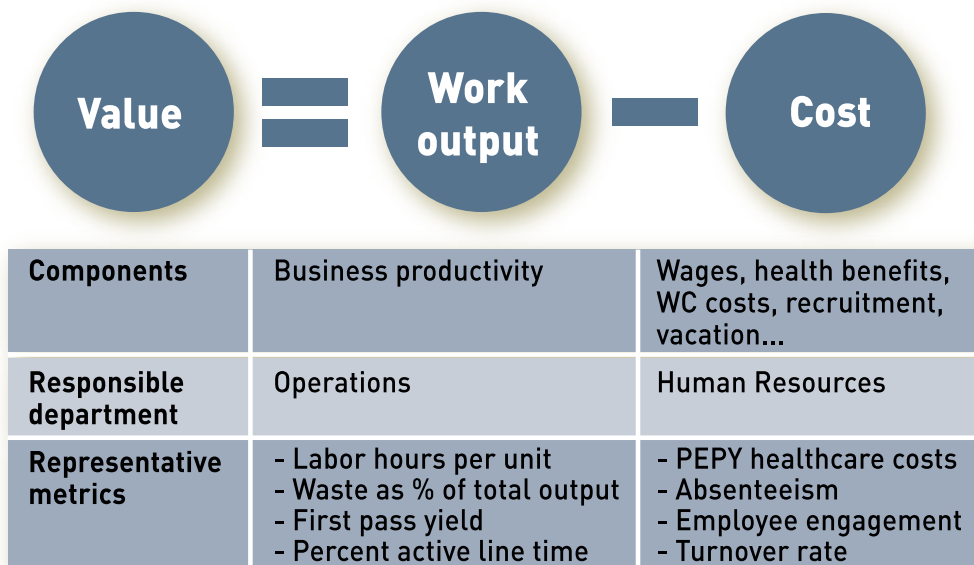| Metric Category | Metric | Description of Metric | Source of data for metric | Value to employer |
|---|---|---|---|---|
| **Productivity - absence** | | | | |
| i. Short-term disability (STD) | Rate = # work days lost by PCMH patients /Total # work days lost among all PCMH patients, vs. same calculation for non-PCMH patients | Measures rate of STD among PCMH patients affecting productivity vs. non-PCMH population | Disability claims, unscheduled leave and FML files | Improved health management among PCMH participants should keep employees at work more often; less unplanned absence and higher productivity. Can be used to demonstrate trend over time. |
| ii. Workers Compensation (WC) | Rate = # work days lost by PCMH patients /# PCMH patients vs. same calculation for non-PCMH patients | Measures rate of WC among PCMH patients affecting productivity vs. non-PCMH population | WC claims data | Improved health management among PCMH participants should keep employees at work more often, with healthier individuals at lower risk for work-related injury. Can be used to demonstrate trend over time. |
| iii. Incidental absence | Rate = # unscheduled days lost among PCMH patients/# PCMH patients vs. same calculation for non-PCMH patients | Measures rate of incidental , unplanned absence | Incidental absence records | Healthier employees should have less illness-related absence and higher productivity. Can be used to demonstrate trend over time. |
| **Productivity - presenteeism** | | | | |
| i. Employee presenteeism (if available) | Rate = Average presenteeism score of PCMH employees / same measure for non-PCMH employees | Measures level of at-work employee job performance. | Employee presenteeism survey | Employees at work who are healthier function at higher levels. Can be used to demonstrate trend over time. |
| **Patient Satisfaction** | | | | |
| i. Patient experience of care survey (such as the Consumer Assessment of Healthcare Providers and Systems – CAHPS Survey) | Rate = Score of PCMH employees / Score of non-PCMH employees | Measures patient's level of satisfaction with experience of care received | Patient experience of care survey | Patients who demonstrate higher levels of satisfaction with care are more likely to be compliant with treatment plan and therefore more likely to have less absence and higher productivity. Can be used to demonstrate trend over time. |
| **Patient Activation (engagement in self-care)** | | | | |
| i. Patient activation survey (such as the Patient Activation Measure Survey) | Rate = Score of PCMH employees/Score of non-PCMH employees | Measures the level of engagement patients have in playing active role in their own care. | Patient activation survey | Patients who take a more active role in the care management have demonstrated better compliance with treatment plan, treatment to clinical goals, higher productivity and less absence. Can be used to demonstrate trend over time. |

## Limitations

This white paper is not intended to provide a formal methodology for analyzing PCMH program implementation. This goal would require far more detail than what we provide in this paper and would require considerably more elaboration on design of the analysis, use of a comparison population, statistical methodology, treatment of confounding variables, and several other considerations. Instead, this white paper is intended to provide employers with a basic understanding of health measures germane to employer concerns, each of which ultimately has a measurable business impact.

## Metrics—a look ahead

The metrics included in this white paper can provide employers with a broad-based understanding of both the opportunity and impact of PCMH on their healthcare benefits enrollees. While these metrics provide a clearer view of the relationship between health and total health-related costs, they may fail to demonstrate the causal impact of health on business performance. The above noted metrics mostly reside in the human resources domain, and therefore, reflect the primary—and understandable—goal of cost containment.

Figure 12 shows a simplified organizational perspective on the roles of business operations and human resources on employee value. The former is responsible for generating revenue, while the latter is responsible for managing employee wage and benefits-related costs. Metrics for each of these silos reflect the corresponding focus areas; seldom do businesses evaluate the impact that changes in business processes have on healthcare expenditures and productivity, or, more relevant to this discussion, the impact of investments in health on business output, and ultimately, revenue. Enhanced workforce health resulting from improved care delivery impacts more than just healthcare costs and lost work time due to absence and presenteeism. Healthier individuals are likely able to produce more and better quality work, contributing directly to increasing employer revenues. There is surprisingly scant data showing the relationship between health and business operations, but recent survey data indicates that organizations that have incorporated health as a business strategy have outperformed those that have placed a lower priority on this area (19). While the survey fails to distinguish between a causal relationship or simply an association between healthier workforces and increased organizational profitability, it is certainly an intriguing notion. As our understanding grows, organizations may soon begin to more effectively integrate health and productivity metrics

## Traditional View of Employee Value



| Components | Business productivity | Wages, health benefits, WC costs, recruitment, vacation... |
|---|---|---|
| Responsible department | Operations | Human Resources |
| Representative metrics | - Labor hours per unit<br>- Waste as % of total output<br>- First pass yield<br>- Percent active line time | - PEPY healthcare costs<br>- Absenteeism<br>- Employee engagement<br>- Turnover rate |

**Figure 12.** Traditional view of employee value.

with business operations measures to reveal what may be an even more compelling view of the impact of health on business performance.

Accordingly, in the setting of a PCMH program, employers may want to more comprehensively evaluate the impact of the program not only health, productivity and satisfaction measures as outlined, but also on business performance. Employers will need to review existing business operations metrics to determine how to most effectively achieve this objective.

## Employer next steps—How to use these measures

After reviewing this white paper, employers may be interested in capturing data for calculating metrics outlined above. Review of employer-specific data can help to identify and prioritize health, productivity, and other related business cost drivers for potential intervention. Employers that are experiencing suboptimal compliance rates with preventive care and disease-specific preventive services, excessive hospitalization rates and specialist use, and an unfavorable healthcare cost trend may want to consider PCMH program implementation as a means to improve care coordination and enhance compliance with recommended treatment.

Accordingly, employers can present these metrics to their health plans and their other health management vendors to provide a high-level perspective on healthcare quality and treatment outcomes as a starting point for further discussions. As purchasers, employers need to better understand what they are buying in the healthcare marketplace. These data will help them make better choices.

Because illness-related lost productivity data typically are not available from health plans, employers themselves need to take the lead in quantifying the total healthcare and productivity cost for their workforce.

## Summary/Conclusions

Employers are becoming more discerning consumers when it comes to health benefits. In order to more fully understand the value of the healthcare services they are purchasing, it is important to have a well-defined set of metrics to use for evaluation of the impact of health benefits program on healthcare quality, outcomes, and cost, as well as workforce productivity. This is particularly the case with innovative approaches to healthcare delivery, including PCMH. This white paper provides representative metrics suitable for use by most, if not all, employers, along with a conceptual framework for their use. Appropriately implemented, these metrics can provide meaningful insight into baseline population health issues and potential value of PCMH implementation, and can help quantify the benefit of existing PCMH program offerings from an employer perspective.

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