

# Value-based Insurance Design: Aligning Incentives to Bridge the Divide Between Quality Improvement and Cost Containment

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Rising costs and suboptimal clinical quality have spawned efforts to redesign healthcare benefit packages. Momentum has gathered behind 2 trends; the first, represented by disease management initiatives and pay-for-performance programs, focuses on the quality of care, and uses tools to manage patient health. The second trend, represented by increased patient cost sharing and consumer-driven health plans, focuses on the cost of care and uses financial incentives to alter patient and provider behavior. These 2 trends create a conflict for the patient in that disease management programs—designed to improve patient self-management—aim to enhance compliance with specific clinical interventions, while rising copayments create financial barriers that discourage the use of these recommended services. When patients are required to pay more for their healthcare, they buy less, even if the intervention is potentially lifesaving. Thus, the challenge for purchasers is to devise benefit packages that incorporate a range of features that complement each other in the effective and efficient delivery of care while explicitly avoiding the unwanted negative clinical effects associated with increased cost sharing.

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**V**alue-based insurance design (VBID) provides an opportunity to fundamentally change the way health benefits are structured, and to reframe the national debate on healthcare to focus on the value of health services—not on cost or quality alone. In a VBID benefit, cost sharing is still utilized, but a “clinically sensitive” approach is explicitly designed to mitigate the adverse health consequences of high out-of-pocket expenditures. By aligning financial incentives, VBID can address several important inconsistencies in the current system and work synergistically with other initiatives to optimize healthcare effectiveness and efficiency.

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## BACKGROUND

As increases in healthcare expenditures outpace inflation, purchasers are forced to adjust their benefit strategies to maintain competitiveness in local and global markets. If beneficiaries were indifferent to employer provision of health insurance, constraining healthcare cost growth from the employer perspective could be achieved simply by providing less generous coverage or no coverage at all. Because the value of healthcare benefits is not exclusively financial and employees demand

coverage, a preferable approach would be to design health benefit packages that openly address the problem of cost growth, yet explicitly aim to optimize the health of the beneficiaries.

From the most recent data available, employers are using a combination of less coverage and alternative types of health plans to reduce healthcare expenditures. Unfortunately, the percentage of employers offering health benefits is at its lowest point in 2 decades.<sup>1</sup> While rising healthcare costs are the main impetus behind the redesign of health benefits, concerns regarding the quality of healthcare share the spotlight. These 2 issues, increasing costs and suboptimal quality of care, have led to 2 prevailing trends in benefit design. The first trend, focusing on improving the quality of care, uses tools to manage and improve patient health (eg, disease management [DM] and pay-for-performance [P4P] initiatives). The second addresses the cost of care, focusing on increasing the share of expenses paid by the beneficiary (eg, consumer-driven health plans [CDHPs], increasing copays at the point of service). These 2 trends often conflict. Thus, the challenge for purchasers is to devise benefit packages that incorporate a range of features that complement each other in the effective and efficient delivery of care.

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## IMPROVING QUALITY: DISEASE MANAGEMENT AND PAY FOR PERFORMANCE

### Disease Management

Disease management programs evolved in the mid-1990s as a method to address chronic diseases and the health benefit costs associated with their treatment.

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They attempt to administer population-based, patient-centered treatment focused on systematic care of chronic diseases. Programs focus on conditions such as diabetes mellitus, congestive heart failure, coronary heart disease, asthma, and depression—diseases that have considerable potential for quality improvement and cost reduction.

Disease management programs are common among health insurers, particularly within their managed care products. In addition to the private sector, more than 20 states have implemented DM within their Medicaid programs in an effort to contain healthcare costs.<sup>2</sup> Further, the recently launched Medicare Health Support Program of the Centers for Medicare & Medicaid Services includes DM as a method of improving quality.

Disease management programs have generally been found to improve the quality of care when compared with standard practice.<sup>3</sup> They do so in a number of ways, for the most part by working with patients and healthcare providers to increase patient adherence to accepted medical management and lifestyle strategies. Disease management programs will be more effective when the target population is at high risk of adverse clinical outcomes and when the standard of care outside of the DM program is suboptimal.

Although DM programs have captured the imagination of health plan administrators and government policy makers, the evidence is inconclusive to support their effectiveness in lowering costs.

The conclusion is plausible that DM programs do increase the quality of care, but do not substantially decrease costs. Disease management programs can only be cost saving if the services they encourage are cost saving and, unfortunately, it is rare to find cost-saving health services. The key factor is the number of patients needed to treat in DM programs to avert an adverse and costly clinical event. The economic impact of DM will relate to the ability of the program to target resources to the cases in which the most benefit can be achieved.

### Pay for Performance

Like DM programs, P4P programs attempt to reduce the gap between actual and recommended care. These programs monetarily reward providers who consistently follow selected practices when treating patients, with the goal of achieving substantive improvement in quality. Healthcare administrators increasingly support P4P programs in light of evidence that suggests they increase preventive services, decrease overuse, and result in more widespread use of evidence-based medicine.<sup>4</sup>

The literature assessing P4P programs, as with that for DM programs, does not support a definitive statement on whether these programs decrease or increase

costs. Pay-for-performance programs may themselves be cost neutral, if the bonus money paid out to physicians comes from penalties for lack of improvement or poor performance. Many proponents expect that P4P programs will decrease costs because of health gains, even if the funds are paid above existing payment rates.

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### CONSTRAINING HEALTHCARE COSTS: INCREASING COST SHARING TO THE BENEFICIARY

The 2006 Kaiser Foundation Employer Benefit Survey revealed that the growth in healthcare premiums moderated somewhat in 2006 (7%-8%) when compared with double-digit increases in recent years.<sup>1</sup> This reduced growth can be attributed to the increased shifting of healthcare costs from the employer to the beneficiary. This cost sharing is achieved, for the most part, through copays or coinsurance at the time of service or high-deductible health plans such as health savings accounts (HSAs) and other CDHPs. The goal of these plans is to induce consumers to be more cost conscious when obtaining healthcare, with the expectation that enhanced patient accountability will result in overall cost savings.

Little debate exists over the economic theory that an increase in out-of-pocket expenses will lead to less consumption of healthcare services. The Rand Health Insurance Experiment is among the many studies that have demonstrated that when confronted with higher costs, individuals will purchase less care, leading in some cases to lower total expenditures.<sup>5</sup>

Ideally, higher patient copayments would discourage only the utilization of low-value care. For this important assumption to be achieved, patients must be able to distinguish between high-value and low-value interventions. However, when this ability to distinguish among services does not occur, increased cost sharing has an important potential negative component. A large and growing body of evidence demonstrates that, in response to increased untargeted “across-the-board” cost sharing, patients decrease the use of lifesaving (eg, immunizations, cancer screening, appropriate prescription drug use) healthcare and may have worse health outcomes as a result.<sup>6-9</sup>

There is not yet a substantial body of evidence evaluating CDHPs, and it is important to note that employee uptake, and therefore the clinical and financial impact of any given CDHP, will depend on its design (eg, how high is the deductible, etc).<sup>10</sup> Whether savings associated with CDHPs represent one-time reductions in spending or reductions in the long-term rate of healthcare cost growth is unclear. If these plans do not alter rates

of cost growth, they will not provide a long-term solution to employer cost concerns.

Thus far, empirical evidence based on analysis of claims data suggests the cost-saving potential of CDHPs might be less than proponents expected. For example, Parente and colleagues<sup>11</sup> found that CDHP enrollees had lower total expenditures than enrollees in preferred provider organizations, but higher expenditures than the health maintenance organization cohort. Physician visits and pharmaceutical use and costs were lower in the CDHP cohort than the other 2 groups. However, hospital costs for CDHP enrollees, as well as total physician expenditures, were significantly higher.

The literature is mixed regarding satisfaction of enrollees with CDHPs. Fronstin and Collins<sup>12</sup> reported that individuals with CDHPs were less satisfied with their health plan than individuals with more comprehensive health insurance coverage. Another concern is that high-cost-sharing CDHPs may lead to risk segmentation in the employer group, resulting in older, sicker, and lower-wage patients facing higher premiums. These concerns, among others, may be contributing to the relatively sluggish uptake of CDHPs.

Plans with high deductibles and copays have a much greater potential to conflict with concurrent P4P or DM programs. For example, evidence suggests that copays for patients enrolled in DM programs are similar to, and rising as fast as, copays for individuals not enrolled in DM programs.<sup>13</sup> The fact that targeted efforts to enhance quality are likely to be hindered by increased cost sharing illustrates an inherent contradiction in current benefit design trends. The resources devoted to DM or P4P will not be as effective when enrollees face high levels of cost sharing for those same interventions. Clearly, efficiencies can be achieved if this misalignment of incentives is addressed in future benefit designs.

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**ALIGNING INCENTIVES:  
VALUE-BASED INSURANCE DESIGN**

In response to the likely adverse clinical effects of “across-the-board” cost shifting, Fendrick and colleagues proposed an approach to set the patient copay amount relative to the value—not the cost—of the intervention.<sup>14,15</sup> In this setting, cost sharing is still utilized, but a “clinically sensitive” approach is explicitly designed to mitigate the adverse health consequences of high out-of-pocket expenditures. Originally referred to as the “benefit-based copay” for prescription drugs, the concept is now referred to as *value-based insurance design* as its application is broadened to all sectors of healthcare delivery. Recognizing that the value of vari-

ous services differ and the value of any specific intervention likely varies across patients, more efficient resource allocation can be achieved when the amount of patient cost sharing is a function of the value of the specific healthcare service to a targeted patient group.

**Two Approaches to Value-based Insurance Design Targeting**

In practice, there are 2 general approaches to VBID targeting. The first approach simply targets services known to be of high value (eg, angiotensin-converting enzyme inhibitors). Although some users of the services have the target higher-value condition(s) (eg, congestive heart failure, myocardial infarction) than others (eg, essential hypertension), the system does not attempt to differentiate among individuals who receive a specific intervention.

The second approach targets patients with select clinical diagnoses (eg, coronary artery disease) and lowers copays for specific high-value services (eg, statins,  $\beta$ -blockers). The second approach, which may require a more sophisticated data system to implement, creates a differential copay based on the indication for a specific medical intervention.

**Targeting Copays Based on Clinical Indication: Example of Statins and Heart Disease**

Statins block an enzyme (HMG-CoA reductase) the body needs to produce cholesterol, leading to a reduction in low-density lipoprotein (“bad”) cholesterol levels in the blood. By lowering blood cholesterol levels, statins reduce the risk of heart attack, stroke, and death in people with known heart disease (secondary prevention) and in people at risk for coronary artery disease (primary prevention).

The evidence is abundant documenting the relative health value of statin therapy for individuals with known cardiovascular disease when compared with that for persons with established risk factors but without documented disease. Several trials have demonstrated an approximately 10-fold difference in the number of individuals needed to be treated (NNT) to prevent an adverse cardiac event in the higher-risk secondary prevention population (NNT of approximately 50 to prevent 1 event per year) than in the lower-risk primary prevention population (NNT of approximately 500 to prevent 1 event per year).<sup>16</sup>

Despite the well-documented benefits of statin therapy, considerable evidence shows substantial underutilization of this potentially lifesaving class of drugs. Ellis and colleagues, as well as other researchers, demonstrated a significant effect of patient copayment on statin adherence—as copays increased, adherence

decreased. Interestingly, no detectable difference was found in the suboptimal compliance rates with statins between the secondary- and primary-prevention patient groups.<sup>16</sup> Given this underuse, the value of medical spending could be enhanced if compliance were greater,

particularly for the groups in which statins offer the most benefit (ie, secondary prevention).

In a recently published paper, Goldman and colleagues simulated a VBID policy that eliminated copayments for statin therapy for patients with high and medium risk for cardiovascular disease (from \$10 to \$0) but raised them (from \$10 to \$22) for low-risk patients.<sup>17</sup> Based on a national sample of 6.3 million adults undergoing statin therapy, this policy would avert 79 837 hospitalizations and 31 411 emergency department admissions—yielding a total savings of more than \$1 billion annually. While modeling studies such as this one are informative, no published studies have empirically quantified the changes in medication adherence based on empirical observation of patient responses to copay reductions (as opposed to copay increases).

#### **M-HEALTHY: FOCUS ON DIABETES PROGRAM Implementation of Value-based Insurance Design: The University of Michigan Experience**

**Motivation.** In 2004, university leadership called for the identification, implementation, and evaluation of potentially cost-effective investments in the health of the University of Michigan workforce.

**Benefit Structure.** The 70 000 University of Michigan current employees and their dependents in the prescription drug plan were enrolled in several different health plans offered by the university. The University of Michigan contracted with a single pharmacy benefits manager for all of its employees and dependents, regardless of health plan choice.

**Needs Assessment.** Using pharmacy claims, utilization rates of high-value therapies were assessed. The combination of disease prevalence, extent of underutilization of essential therapies, and health service utilization/costs led to diabetes being identified for an initial value-based insurance design (VBID) intervention. This initiative was facilitated because patients with diabetes can be identified solely through pharmacy data.

**Services Selected for Copay Reduction.** Several medication classes (eg, antihyperlipidemic, antihypertensive, hypoglycemic, and antidepressant agents) demonstrated in the literature as providing high value in preventing the long-term complications of diabetes.

**Value-based Insurance Design Implementation.** Once the clinical conditions and related services were identified, processes were developed with the university's pharmacy benefits manager to provide the targeted copay reductions at the point of service. All University of Michigan employees and clinicians were notified by letter and e-mail of the pilot program.

**Value-based Insurance Design Intervention.** The University of Michigan employs a 3-tiered formulary with copays of \$7, \$14, and \$24 for generic, preferred brand, and nonpreferred brand medications, respectively. This underlying tiered formulary structure was left intact with the new value-based benefit overlaid. To maintain the tiered formulary, the VBID intervention lowers copays in a graded fashion (tier 1 decreased by 100%, tier 2 by 50%, and tier 3 by 25%) for the targeted medication classes.

**Employee Reaction.** The program received overwhelming employee support through numerous e-mail testimonials, and virtually no dissent.

#### **PRACTICAL EXPERIENCE WITH VALUE-BASED INSURANCE DESIGN**

Several firms are experimenting with various forms of VBID. Pitney Bowes (Stamford, Conn) and ActiveHealth Management (New York, NY) use the first approach, in which all users of specific classes of drugs pay lower copayments, regardless of indication. The municipality of Asheville, North Carolina, and the University of Michigan implemented a program that lowered copayment rates for selected services only for their employees with a specified clinical condition, diabetes mellitus. The Asheville program is pharmacist-led and includes coached self-management. This program has since expanded to include other employers.

The University of Michigan implemented the M-Healthy: Focus on Diabetes Program in July 2006 for its 2200 employees and their dependents with a diagnosis of diabetes mellitus.<sup>18</sup> This program provides copay reductions for targeted interventions deemed from the medical evidence as highly beneficial for persons with diabetes. Many of these medications are used for a wide range of other diseases, but only individuals with diabetes are eligible for copay reductions. The University of Michigan experience provides some insight into the issues surrounding VBID implementation.

#### **FINANCIAL EFFECTS OF VALUE-BASED INSURANCE DESIGN**

The accounting equation that calculates the financial impact of a VBID program lowering copays for any given service is straightforward. Specifically, the cost to the

**Calculating the Economic Effects of Value-based Insurance Design (VBID)**

**Equation 1:**

Added cost to purchaser of copay reduction\* =  $U^{H,S}(C^{HO} - C^{HV}) + U^{H,N}(P^H - C^{HV})$

$U^{H,S}$  = Continuing users of targeted (high-value) services

$U^{H,N}$  = New users of targeted (high-value) services (includes increased use by those previously prescribed)

$P^H$  = Price of high-value services

$C^{HO}$  = Original (pre-VBID) copay for high-value services

$C^{HV}$  = Copay for high-value services under VBID

**Equation 2:**

Decreased cost to purchaser of copay increase =  $U^{L,S}(C^{LV} - C^{LO}) + U^{L,Q}(P^L - C^{LO})$

$U^{L,S}$  = Continuing users of untargeted (low-value) services

$U^{L,Q}$  = Previous users of untargeted (low-value) services who stop using (quit) or use less after the copay increase

$P^L$  = Price of low-value services

$C^{LO}$  = Original (pre-VBID) copay for low-value services

$C^{LV}$  = Copay for low-value services under VBID

\*Assumes no cost offsets from clinical gains to greater use of high-value services.

employer of the lower copays is the extra share of spending for the services that would have been used anyway (price effect) plus the purchaser's share of the costs of increased consumption due to the copay reductions (volume effect) (see **Equation 1**).

Offsetting these direct costs of copay reduction are the savings incurred by reductions in future services that are avoided due to better clinical outcomes. For example, the direct costs of lower copays and resultant increased utilization of asthma medication would be offset, at least partially, by savings because of fewer emergency room visits and hospitalizations for acute asthma exacerbations.

If immediate cost offsets are necessary to finance the short-term incremental increase in employer costs of lower copays, one can calculate the reduced spending effects of simultaneous targeted copay increases. In contrast to cost increases related to copay lowering, **Equation 2** accounts for decreased employer expenditures due to higher cost sharing for the beneficiary at point of service (price effect) as well as the expected decreased utilization of the intervention due to the higher out-of-pocket cost (volume effect). This targeted copay increase approach for a selected low-risk patient group was used to fund the high-risk patient copay reduction in the simulation of statins by Goldman et al.<sup>17</sup>

An alternative and perhaps more attractive approach to fund a targeted VBID copay relief program would be

to offset the estimated increased employee costs associated with copay reductions (Equation 1) with a copay increase spread across all of the remaining services. As many purchasers strive to maintain a constant (and, if possible, decreased) trend in healthcare cost growth, this strategy, which subsidizes targeted copay reductions for highly valued services with a "diluted" copay increase that is evenly distributed over the remaining nontargeted services, may be preferable. If the targeting is done well, the value of these services will be lower, on average, than that of the targeted services. Moreover, because the copay increases are spread across a large number of services, the potential for negative clinical effects is smaller because the copay increases would be minimal given the number of services to which the added

costs are applied. Purchasers should find a quality-enhancing, cost-neutral strategy tied to a prespecified level of healthcare expenditures to be attractive compared with the status quo.

The financial impact of a VBID program will depend on the level and precision of targeting and the extent or direction of the changes in copays. Because many clinical services provide higher value for a select subset of patients, the better the system is at identifying those patients, the more likely the system will be to achieve a high financial return. Employers with more targeted programs incur lower treatment costs, because fewer individuals are eligible for lower copays. Even in the setting of these lower VBID-related costs, most of the financial and clinical gains are incurred because the patients who benefit the most are the ones who receive the lower copays. Ultimately, a plan design that aligns incentives to encourage the use of high-value services and likewise discourages the use of interventions of marginal value will improve the effectiveness and efficiency of healthcare resources.

IS VALUE-BASED INSURANCE DESIGN  
COMPATIBLE WITH HIGH-DEDUCTIBLE  
HEALTH PLANS?

Clearly, high-deductible CDHPs are on the leading edge of insurance reform. Although there certainly are

**Table.** Potential Barriers to Successful Value-based Insurance Design Implementation

Concern over costs of increased utilization
Cost of implementation
Lack of information technology infrastructure
Insufficient evidence to differentiate services and patient groups
Human resource concerns
Fraud
Legal antidiscrimination barriers
Privacy concerns
Unintended incentives
Adverse selection

merits to greater individual autonomy in the purchasing of healthcare services, information gaps preclude informed decision making in many instances. Moreover, the data are irrefutable that the use of essential medical services will be curtailed when individuals are required to pay increasing amounts of their own funds. A feasible compromise would be to add a “VBID waiver” to a high-deductible health plan or HSA. Such a waiver is similar to the current exemption for preventive services and would entail certain highly valued services to be provided to beneficiaries with little or no out-of-pocket expense. Some firms, such as Aetna, have already experimented with this approach.<sup>19</sup> While a VBID waiver intervention may be viewed as “soft paternalism,” such an approach would mitigate much of the undesirable effects of untargeted cost sharing. From the financial perspective, this hybrid HSA/VBID strategy may increase expenditures compared with a standard HSA, but at least the payer would be aware that these added costs were incurred for services of the highest value, some of which may save money in the long term as a result of improved clinical outcomes. In fact, assuming patient groups are heterogeneous, a VBID program can achieve greater value for the same level of cost sharing by targeting only the high-benefit services for high-risk patients.

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**VALUE-BASED INSURANCE DESIGN:  
BRIDGING THE QUALITY IMPROVEMENT-  
COST CONTAINMENT DIVIDE**

Value-based insurance design is a clinically sensitive form of cost sharing because it recognizes that clinical services vary in the value they provide to patients, and that not all patients with a specific clinical condition

receive the same level of benefit from a specific intervention. Although attractive in theory, many potential barriers to its implementation exist (Table), each of which creates a specific yet surmountable challenge. From early experience in the field, VBID programs are feasible, deemed acceptable by all vested stakeholders, and well received by beneficiaries. By allowing different cost-sharing provisions for different services, value can be enhanced without removing the essential role of cost sharing in the system overall. Value-based insurance design can address several important inconsistencies in the current system and work synergistically with other initiatives such as CDHPs, DM, and P4P to optimize healthcare effectiveness and efficiency.

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**REFERENCES**

1. Claxton G, Gabel J, Gil I, et al. Health benefits in 2006: premium increases moderate, enrollment in consumer-directed health plans remains modest. *Health Aff (Millwood)*. 2006 Sep 26 [Epub ahead of print].
2. Fireman B, Bartlett J, Selby J. Can disease management reduce health care costs by improving quality? *Health Aff (Millwood)*. 2004;23:63-75.
3. Weingarten SR, Henning JM, Badamgarav E, et al. Interventions used in disease management programmes for patients with chronic illness—which ones work? Meta-analysis of published reports. *BMJ*. 2002;325:925.
4. Benko LB. A rewarding relationship. Hospitals and docs are seeing more of their pay tied to performance based on quality measures and other contractual objectives. *Mod Healthc*. 2003;33:28-30, 34-35.
5. Manning WG, Newhouse JP, Duan N, Keeler EB, Leibowitz A, Marquis MS. 1987 Health insurance and the demand for medical care: evidence from a randomized experiment. *Am Econ Rev*. 1987;77:251-277.
6. Gibson TB, Ozminkowski RJ, Goetzel RZ. The effects of prescription drug cost sharing: a review of the evidence. *Am J Manag Care*. 2005;11:730-740.
7. Rice T, Matsuoka KY. The impact of cost-sharing on appropriate utilization and health status: a review of the literature on seniors. *Med Care Res Rev*. 2004;61:415-452.
8. Heisler M, Langa KM, Eby EL, Fendrick AM, Kabeto MU, Piette JD. The health effects of restricting prescription medication use because of cost. *Med Care*. 2004;42:626-634.
9. Siu AL, Sonnenberg FA, Manning WG, et al. Inappropriate use of hospitals in a randomized trial of health insurance plans. *N Engl J Med*. 1986;315:1259-1266.
10. Lo Sasso AT, Rice T, Gabel JR, Whitmore H. Tales from the new frontier: pioneers' experiences with consumer-driven health care. *Health Serv Res*. 2004;39:1071-1090.
11. Parente ST, Feldman R, Christianson JB. Evaluation of the effect of a consumer-driven health plan on medical care expenditures and utilization. *Health Serv Res*. 2004;39:1189-1210.
12. Fronstin P, Collins SR. Early experience with high-deductible and consumer-driven health plans: findings from the EBRI/Commonwealth Fund Consumerism in Health Care Survey. *EBRI Issue Brief*. 2005 Dec;(288):4-28.
13. Chernew ME, Rosen AB, Fendrick AM. Rising out-of-pocket costs in disease management programs. *Am J Manag Care*. 2006;12:150-154.
14. Fendrick AM, Smith DG, Chernew ME, Shaw SN. A benefit-based copay for prescription drugs: patient contribution based on total benefits, not drug acquisition cost. *Am J Manag Care*. 2001;7:861-867.
15. Fendrick AM, Chernew ME. Value-based insurance design: a “clinically sensitive” approach to preserve quality and contain costs. *Am J Manag Care*. 2006;12:18-20.
16. Ellis JJ, Erickson SR, Stevenson JG, Bernstein SJ, Stiles RA, Fendrick AM. Suboptimal statin adherence and discontinuation in primary and secondary prevention populations. *J Gen Intern Med*. 2004;19:638-645.
17. Goldman DP, Joyce GF, Karaca-Mandic P. Varying pharmacy benefits with clinical status: the case of cholesterol-lowering therapy. *Am J Manag Care*. 2006;12:21-28.
18. Michigan Healthy Community. M-healthy: focus on diabetes. 2004. Available at: <http://www.umich.edu/~hrram/mhealthy/improve/diabetes.html>. Accessed October 10, 2006.
19. Robinson JC, Yegian JM. Medical management after managed care. *Health Aff (Millwood)* [serial online]. Jan-Jun 2004;suppl. web exclusive:W4-269-80. Available at: <http://content.healthaffairs.org/cgi/reprint/hlthaff.w4.269v1>. Accessed October 17, 2006.