

# Diabetes Pharmacy Management: Balancing Safety, Cost, and Outcomes

Jeffrey D. Dunn, PharmD, MBA

Already a burdensome disease in managed care, type 2 diabetes is a growing concern among plan stakeholders. The increasing emphasis on this chronic condition is exemplified by the fact that there are currently 9 classes of medications available to treat diabetes, while only 4 were available in 1995.<sup>1</sup> Despite the increasing armamentarium of antidiabetes medications, nearly half of patients fail to achieve the American Diabetes Association's (ADA's) recommended glycosylated hemoglobin (A1C) goal of less than 7%.<sup>2,3</sup>

In addition to a growing burden of disease, the financial pressures associated with diabetes are increasing. Diabetes drug and treatment costs in the United States doubled in the 6 years leading up to 2007, and likewise, Americans with the disease have nearly doubled their spending on drugs for diabetes.<sup>4</sup> The average prescription cost for diabetes therapies rose from \$56 in 2001 to \$76 in 2007.<sup>4</sup> Furthermore, claims data from plans indicate that diabetes drug costs in managed care have been steadily increasing over the past several years.<sup>5</sup>

Among a myriad of other factors, the increasing financial burden associated with diabetes contributes significantly to medication nonadherence in patients who suffer from the disease. In a population-based, cross-sectional study, only 35.4% of patients with type 2 diabetes were adherent to all the drugs prescribed for them, and only 50.0% were adherent to their oral antidiabetic medications.<sup>6</sup> The role of financial burden in this nonadherent dynamic is well documented, and drug cost remains among the leading reasons cited by patients for not taking their medications as prescribed.<sup>7</sup>

## Patient and Health System Considerations on Adherence, Polypharmacy, and Treatment Success

The implications of type 2 diabetes in managed care are such that patients with the disease are likely to be high healthcare resource users. Recent estimates demonstrate that the 5% of patients who utilize more than \$10,000 per year in healthcare resources account for a staggering 75% of all healthcare costs, and predictive modeling indicates that patients with type 2 diabetes are likely to fall into this category.<sup>8</sup> According to these analyses, poor medication adherence and current chronic disease are 2 key factors that predict patients' migration to high-cost healthcare services use, both of which are likely to apply to plan members with type 2

### Abstract

Medication nonadherence, clinical inertia, and contradictory clinical evidence on aggressive disease management contribute to poor outcomes in diabetes management, leading to increased healthcare utilization and costs. As plans increase their focus on the management of type 2 diabetes as an area of high healthcare resource utilization, the importance of appropriate antihyperglycemic agent selection is receiving more attention. The selection process is further complicated by the crowded diabetes drug category, which features several agents with diverse mechanisms of action and routes of administration. The choice of specific antihyperglycemic agents should be predicated on their effectiveness in lowering glucose levels, extraglycemic effects that may reduce long-term complications, safety profiles, tolerability, ease of use, and expense. Beyond appropriate drug selection, pharmacy benefit design also represents an important public health tool for improving treatment adherence and outcomes. Value-based benefit design, in particular, emphasizes high-value medical services by lowering patient copays to encourage plan member use. Essentially, this innovative form of benefit design dictates that the more clinically beneficial the therapy, the lower patients' cost share will be. Other interventions, such as motivational interviewing, pay-for-performance, and medication therapy management, are also being applied to improve treatment adherence and outcomes in the managed care environment, with varying levels of success. Regardless of the specific inventions applied at health plans for improving treatment success in type 2 diabetes, pharmacy director leadership and involvement can contribute to the success of these efforts.

(*Am J Manag Care.* 2010;16:S201-S206)

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diabetes.<sup>8</sup> To improve outcomes and control costs in managed care, patients with type 2 diabetes should be targeted for intervention and resources should be applied to improve treatment adherence and enhance the management of this chronic disease.

In addition to the obvious direct clinical implications of medication nonadherence in type 2 diabetes, this phenomenon can also adversely impact provider prescribing habits. Specifically, patient nonadherence can result in clinical inertia on the part of providers, with patients being less likely to receive intensified therapy when they are nonadherent to initial hypoglycemic medication.<sup>9</sup> In a claims database analysis by Grant et al, 38% of patients who were more than 90% adherent to initial hypoglycemic medication received a dose escalation or additional hypoglycemic agent after 12 months, compared with only 21% of those who were less than 50% adherent to their initial hypoglycemic medication.<sup>9</sup> As such, patients who are initially nonadherent to hypoglycemic therapy may never receive the intensified therapy that is often recommended for the effective management of A1C levels, resulting in worsening outcomes and increased total healthcare costs per patient per year—nearly double those of adherent patients.<sup>10</sup>

As plans increase their focus on the management of type 2 diabetes as an area of high healthcare resource utilization, the importance of appropriate antihyperglycemic agent selection is receiving more attention. The selection process is further complicated by the crowded diabetes drug category, which features several agents with diverse mechanisms of action and routes of administration.<sup>1</sup> The initial step in this process is to define the “value” of the agents, using a combination of comparative clinical data and costs. For example, in the case of a class of diabetes medications that has one drug on the market when another drug launches, the value of the new agent must be defined on the basis of clinical factors (ie, efficacy, safety) and cost. Assuming the original agent from the class has experienced relative success and has good market share, the new agent must demonstrate some sort of benefit in terms of efficacy or safety. When the agents offer similar benefits in terms of efficacy and safety, cost becomes the key factor in determining the value of the new agent. In most cases, only placebo-controlled data are available for new agents upon launch, making comparison on the basis of clinical factors difficult and making cost a determining factor. However, when head-to-head data are available, as in the recent case of liraglutide (a glucagon-like peptide-1 agonist), direct comparisons of efficacy and safety are simplified, and the agent’s value can be determined primarily on its clinical merits rather than its price.

Summarizing this process, the ADA/European Association for the Study of Diabetes (EASD) Consensus Statement offers principles guiding the selection of antihyperglycemic interventions. In this document, the choice of specific antihyperglycemic agents is predicated on the following characteristics of the agents<sup>11</sup>:

- Effectiveness in lowering glucose level
- Extraglycemic effects that may reduce long-term complications
- Safety profiles
- Tolerability
- Ease of use
- Expense

When only data from short-term clinical trials are available, disease-based pharmacoeconomic models may be particularly useful in helping payers project costs.<sup>12</sup> These analyses may demonstrate the cost-effectiveness and value of newer, alternative antihyperglycemic agents even in comparison with generic agents, whose significantly lower drug costs make them seem like the obvious choice. However, pharmacoeconomic models have also demonstrated that the cost-effectiveness of these newer, alternative therapies is sometimes not evident until after 3 years of treatment, again underscoring the importance of medication adherence.<sup>12</sup>

### The Role of Pharmacy Benefit Design

Pharmacy benefit design represents an important public health tool for improving patient treatment and adherence. Most beneficiaries are now covered by incentive-based formularies in which drugs are assigned to one of several tiers based on their cost to the health plan, the number of similar substitutes, and overall safety and efficacy. In addition, some plans also impose benefit caps that limit either the coverage amount or the number of covered prescriptions for a patient. It should be noted, however, that some of these approaches to managing costs, such as prescription limits, cost sharing, and benefit caps, can result in diminishing returns on patient medication adherence and treatment success, as they shift more of the financial burden of prescription drugs to patients.<sup>13</sup>

Since medication cost is a key factor in nonadherence, and a direct correlation appears to exist between increased copays and patient medication discontinuation, reducing patient out-of-pocket costs through reduced copays presents a potential solution for the nonadherence conundrum. However, since reduced copays for patients represent increased costs for payers, value-based benefit design offers a means of mitigating the financial impact on both parties.

In value-based benefit design, copays are reduced, but not eliminated, for patients likely to migrate to the high-resource utilization demographic mentioned previously.<sup>8</sup> This innovative form of benefit design, developed at Harvard and the University of Michigan, emphasizes high-value medical services by lowering patient copays to encourage plan member use. Value-based benefit design dictates that the more clinically beneficial the therapy, the lower patients' cost share will be. This idea is based on the principle of elasticity of demand, which states that as the price of a product or service increases, people tend to purchase it less frequently.<sup>8</sup> As such, value-based benefits adjust patients' out-of-pocket costs for specific services based on an assessment of the clinical benefit achieved.<sup>8</sup> After implementation by employers such as Pitney Bowes, value-based benefit design resulted in a 10% improvement in medication adherence when copays were reduced for certain chronic illnesses such as diabetes.<sup>8</sup>

Looking at Pitney Bowes' experience more closely, value-based benefit design was implemented based on a predictive model showing that low medication adherence was linked to increased healthcare costs.<sup>8</sup> In initiating this program, Pitney Bowes' stakeholders shifted all diabetes drugs and devices from tier 2 or 3 status to tier 1 based on the rationale that reducing out-of-pocket costs would eliminate financial barriers to preventive care and thereby increase adherence and reduce complications.<sup>8</sup> This change made critical brand-name drugs available to most employees and covered dependents at a 10% coinsurance—the same coinsurance level as that for generic drugs—versus the previous cost share of 30% to 50%.<sup>8</sup> As a result, after 2 to 3 years, medication possession rates increased significantly, use of fixed-combination drugs increased (possibly related to simplified adherence), average total pharmacy costs decreased by 7% among employees with diabetes, and emergency department visits decreased by 22% among employees with asthma.<sup>8</sup> Furthermore, overall direct healthcare costs per plan participant with diabetes decreased by 6% using a combined strategy of benefit design and disease management for improving adherence.<sup>8</sup>

### Strategies for Improving Medication Adherence

In addition to pharmacy benefit design initiatives, several strategies have been successfully applied among managed care organizations for improving medication adherence. These various strategies, which will be subsequently reviewed, include pay-for-performance (P4P) initiatives, strengthening patient-provider relationships, patient empowerment initiatives, integrated communication channels, telephonic counseling, medication reminders, and medication therapy management (MTM) initiatives.

P4P initiatives have traditionally offered incentives to providers for meeting designated performance measures in the management of various disease states, such as cardiovascular disease, diabetes, and asthma.<sup>14,15</sup> However, now *both physicians and patients* are getting incentives to improve performance and outcomes, including medication adherence. For example, providers are being awarded financial and nonfinancial incentives (eg, direct payments and "honor roll" status, respectively) when patients refill medications as prescribed. Alternatively, patients are being awarded financial incentives, such as reduced copays, to refill their prescribed medications.

An enhanced level of physician trust has been documented as a contributing factor to medication adherence, making the strengthening of patient-physician relationships a priority at many plans. Among patients grouped by level of trust in their physician, the low-trust group was less likely to be adherent than the high-trust group.<sup>16</sup> Although increasing prescription cost is associated with increasing medication underuse, the high-trust group remained less likely to underuse medications even when they were priced at more than \$100 per prescription.<sup>16</sup>

Scenarios in which the provider is arguing for change, while the patient argues against it, can undermine behavioral interventions and associated positive clinical outcomes, making patient empowerment a key strategy for improving medication adherence.<sup>17</sup> As a result, patient empowerment strategies address the complex interaction of motivations, cues, perceptions, consequences, expectations, and environmental and cultural influences inherent in patients to effectively motivate them to change their behaviors. One such patient empowerment intervention, motivational interviewing, has been demonstrated to be an effective tool for improving patient adherence to medication and lifestyle modification.<sup>17</sup> Motivational interviewing is a client-centered, goal-oriented method for enhancing intrinsic motivation to change by exploring and resolving ambivalence.<sup>17</sup> This method offers more than well-intentioned advice or scare tactics, and allows patients to play a central role in their treatment.<sup>17</sup> Furthermore, motivational interviewing is not based on the information model, but is rather shaped by an understanding of what triggers change. In the primary care setting, interventions should be brief and emphasize the 3 underlying assumptions of motivational interviewing: collaboration, evocation, and autonomy. Several different motivational interviewing techniques exist, including expressing empathy, rolling with resistance, elicit-provide-elicited, supporting autonomy, exploring ambivalence, eliciting change talk, and developing a plan of action.<sup>17</sup> While these

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techniques differ in style and application in the clinical setting, they are all based on the central premise of enhancing intrinsic motivation to change by exploring and resolving ambivalence.<sup>17</sup>

Integrated communication channels involve multiprovider-level communication with patients regarding the importance of medication adherence.<sup>18,19</sup> Healthcare providers charged with communicating these adherence-enhancing messages to patients include physicians, pharmacists, nurses, and case managers, among others. In order for these interventions to be effective, providers must communicate respect for the patient's perspective of his or her condition and provide a rationale for any recommended treatment. Furthermore, healthcare providers should negotiate a plan with the patient and anticipate and address problems as they arise. Adherence should be discussed at every visit in a nonjudgmental way, and a collaborative process of problem solving should be established, similar to the approach in patient empowerment initiatives.

To ensure the effectiveness of any of these strategies for enhancing medication adherence, pharmacy data must be recorded and reported. To evaluate the success of an intervention, a baseline of adherence levels must be established through pharmacy database monitoring of prescription fill and refill rates to allow for comparison and tracking over time. Physicians should be aware of their patients' adherence status relative to baseline, since these healthcare providers interact with patients on a regular basis. Expenditures must also be tracked to determine the return on investment (ROI) for adherence programs. This allows plans to see how the bottom line is being affected, including both drug costs and total medical costs. While increased drug costs are inevitable with a successful program for improving medication adherence, they should be accompanied by reduced total medical costs as outcomes improve (if the intervention is truly effective). Finally, to further ensure the success of initiatives to enhance medication adherence, patients and providers should be educated by communicating policy changes and program characteristics. Specifically, providers should be trained on techniques for improving adherence, such as motivational interviewing, and they must be aware of incentives available for improved adherence as part of P4P initiatives. Likewise, patients must be educated on the benefits of medication adherence and of the potential incentives for filling and refilling prescriptions as part of the program.

### Medication Therapy Management

The goal of MTM is to improve care, enhance communication among patients and providers, improve collaboration

among providers, and optimize medication use, leading to improved patient outcomes. There are 5 core components of MTM<sup>20</sup>:

- Medication therapy review
- A personal medication record
- A medication action plan
- Intervention and referral
- Documentation and follow-up

MTM programs confer a number of benefits to managed care plans in improving the quality of care, including the ability to target drug therapy problems, establish focused medication management interventions, and develop a patient-centered framework.<sup>21</sup> The advent of Medicare Part D in 2007 led the National Committee for Quality Assurance (NCQA) to implement measures for MTM that include annual monitoring of patients on long-term medications, and, in the elderly, assessment of the incidence of potentially harmful drug-disease interactions and the use of high-risk medications.<sup>21</sup> Furthermore, NCQA introduced relative resource use measures to assess value of care when plans report total resource use across various service categories within select disease categories.<sup>21</sup>

According to the Centers for Medicare & Medicaid Services (CMS), the most common MTM interventions reported by Part D sponsors include<sup>20</sup>:

- Face-to-face interaction
- Phone outreach
- Medication review
- Refill reminders
- Intervention letter
- Educational newsletters
- Drug interaction screenings
- Polypharmacy screenings
- Disease-specific clinical initiatives
- Medication profile

At SelectHealth, a plan based in Salt Lake City, Utah, that covers 500,000 commercial lives and is part of an integrated managed care organization, MTM is employed to reduce duplicative prescribing and adverse events. Specifically, MTM assists in the monitoring of medication profiles for members receiving a high number of prescriptions, since the involvement of multiple doctors and pharmacies significantly increases the risk for medication-related adverse events and duplicative prescribing. Ultimately, the plan's goal in using MTM is to evaluate these members and make recommendations in the areas of duplicative therapy, major drug-drug interactions, and generic opportunities. This MTM process at

the plan begins with a list of members who meet the criteria of MTM, compiled monthly. As indicated by CMS, patients in need of MTM services include those who<sup>20</sup>:

- have experienced transitions of care
- have changed medication regimens
- are taking 5 or more chronic medications
- have at least 1 chronic disease or condition
- have laboratory values outside the normal range
- have demonstrated noncompliance in the past
- have limited health literacy
- want to reduce healthcare costs
- are taking high-risk medications or those with a narrow therapeutic index

Next, a pharmacist evaluates each patient for clinical laboratory results, disease states, and clinical notes. Medications are then evaluated to identify drug interactions, duplicative therapies, and possible generic substitutions. This information and the resulting recommendations are discussed with peers at a monthly meeting, from which a number of actions can be taken:

- Generic opportunities communicated to member via letter
- Recommendations involving duplication of therapy, drug-drug interactions, and generic opportunities relayed to prescribing physicians via letter
- Survey mailed to members to evaluate the process
- Survey feedback discussed by pharmacy team
- Records of recommendations stored on SelectHealth servers
- List of all members contacted forwarded to care managers

### **Innovative Interventions for Improving Medication Adherence and Quality of Care**

In addition to these relatively well-established interventions for enhancing medication adherence, managed care stakeholders are exploring the benefits of innovative initiatives such as the patient-centered medical home (PCMH) model, increased incentives for wellness, and Web-based collaborative care. While these interventions, which will be subsequently reviewed, are relatively new in managed care, they have demonstrated promise in improving medication adherence and the overall quality of care.

The PCMH approach is increasing in popularity among a number of managed care organizations; it has been most extensively explored by UnitedHealth.<sup>22</sup> In Florida, UnitedHealth attempted to develop a medical home model in 2007, but experienced limited success because it did not

engage physicians—who were to be compensated only if the pilot program achieved its goals—in the development of the pilot. However, UnitedHealth is continuing its experimentation with the PCMH model by investing more than \$1 million on further pilot experiments, including the primary pilot in Arizona, where a large employer championed the effort. UnitedHealth has worked closely with physicians in these current pilot projects and has agreed to bear some of the initial costs of developing a medical home to improve the likelihood of program success. The current program is designed to provide greater authority and money to clinicians who closely monitor patients' progress, even when they see specialists or require hospitalization. Furthermore, clinicians are no longer rewarded based on the number of services they provide, but on the overall quality of care their patients receive.<sup>22</sup>

The Affinia Group is piloting a new wellness program for employees with diabetes. Workers must sign a covenant to participate in health screenings and classes to manage their disease.<sup>23</sup> Those who sign the covenant get a \$1000 discount on their annual insurance costs, and the program offers \$200 to \$600 toward annual healthcare costs and some free prescriptions and doctor visits for those who take their medicine, see their doctors, and monitor their blood sugar.<sup>23</sup> Likewise, Highmark BlueCross BlueShield (BCBS) in Pennsylvania implemented a wellness program featuring the following interventions: online nutrition education, weight management, stress management, and smoking cessation efforts; tobacco cessation counseling; telephonic tobacco cessation counseling; individual nutrition coaching with a registered dietitian; and onsite classes in stress and weight management.<sup>24</sup> The plan evaluated the cost savings and ROI from these interventions and determined the 4-year savings to be \$1,335,524. Factoring in program expenses of \$808,403, Highmark BCBS realized an ROI of \$1.65 for every dollar spent on the program.<sup>24</sup>

The implementation of Web-based collaborative care, another innovative care intervention, was evaluated in a 12-month, open, randomized, single-center, controlled trial with parallel-group design conducted between August 2002 and May 2004 in a nonprofit healthcare system in the Northwest.<sup>25</sup> In the study, patients with type 2 diabetes were randomized to receive either usual care or usual care plus Web-based care management. The Web-based group received 1 hour of Web-based care management including a review of electronic medical records and development of an action plan, followed by online counseling and medical records review by a care manager. The researchers reported a significant reduction in A1C levels for patients in the Web-based management group versus the usual-care group (mean

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group difference, 0.7%;  $P = 0.01$ ). In addition, more patients in the intervention group had A1C levels less than 7% after 12 months compared with the usual-care group (33% vs 11%, respectively;  $P = 0.03$ ).<sup>25</sup>

## Conclusions

Despite the availability of clinically effective therapies for type 2 diabetes, many patients suffering from the disease are still not achieving the ADA-recommended A1C level goal of less than 7%, leading to increased healthcare utilization and costs. Medication nonadherence, clinical inertia, and contradictory clinical evidence on aggressive disease management contribute to these poor outcomes in diabetes management. Diabetes care begins with the selection of a pharmacologic agent for treatment. Considerations include the availability of specific antihyperglycemic agents, as well as their safety, efficacy, and costs. Earlier intensification of therapy to achieve therapeutic goals is recommended to manage A1C levels and reduce disease-related complications. Furthermore, the use of combination therapy is increasing and may be associated with improved medication possession rates and decreased healthcare utilization.

Juggling the clinical, financial, and behavioral factors related to the growing financial burden of diabetes can be challenging. As the economic burden of this chronic disease continues to escalate, payers and employers are offering innovative solutions to improve outcomes and reduce costs. In fact, several proven strategies exist to reduce diabetes-related healthcare costs and improve overall outcomes. Most, but not all, of these programs continue to demonstrate a value-added benefit for all stakeholders—patients, employers, and payers—and pharmacy director leadership and involvement can contribute to the success of these efforts.

**Author Affiliations:** SelectHealth, Inc. Murray, Utah.

**Funding Source:** Financial support for this work was provided by Novo Nordisk.

**Author Disclosure:** Dr Dunn has received consulting fees from AstraZeneca, Takeda, and United BioSource. Dr Dunn also received payment for involvement in the preparation of this manuscript from Novo Nordisk.

**Authorship Information:** Concept and design; acquisition of data; analysis and interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content.

**Address correspondence to:** Jeffrey D. Dunn, PharmD, MBA, SelectHealth, 5381 Green Street, Murray, UT 84123. E-mail: jeffrey.dunn@selecthealth.org.

## REFERENCES

1. Nathan DM. Finding new treatments for diabetes—how many, how fast . . . how good? *N Engl J Med*. 2007;356(5):437-440.
2. American Diabetes Association. Standards of medical care in diabetes—2007. *Diabetes Care*. 2007;30(suppl 1):S4-S41.
3. Hoerger TJ, Segel JE, Gregg EW, Saaddine JB. Is glycemic control improving in U.S. adults? *Diabetes Care*. 2008;31(1):81-86.
4. Alexander GC, Sehgal NL, Moloney RM, Stafford RS. National trends in treatment of type 2 diabetes mellitus, 1994-2007. *Arch Intern Med*. 2008;168(19):2088-2094.
5. SelectHealth, Inc. Data on file. 2010.
6. Mateo JF, Gil-Guillén VF, Mateo E, Orozco D, Carbayo JA, Merino J. Multifactorial approach and adherence to prescribed oral medications in patients with type 2 diabetes. *Int J Clin Pract*. 2006;60(4):422-428.
7. Patient nonadherence: tools for combating persistence and compliance issues. Frost & Sullivan White Paper. 2005. <http://www.frost.com/prod/servlet/cpo/55342907.pdf>. Accessed June 23, 2010.
8. Mahoney JJ. Value-based benefit design: using a predictive modeling approach to improve compliance. *J Manag Care Pharm*. 2008;14(6)(suppl S-b):S3-S8.
9. Grant R, Adams AS, Trinacty CM, et al. Relationship between patient medication adherence and subsequent clinical inertia in type 2 diabetes glycemic management. *Diabetes Care*. 2007;30(4):807-812.
10. Sokol MC, McGuigan KA, Verbrugge RR, Epstein RS. Impact of medication adherence on hospitalization risk and healthcare cost. *Med Care*. 2005;43(6):521-530.
11. Nathan DM, Buse JB, Davidson MB, et al. Medical management of hyperglycemia in type 2 diabetes: a consensus algorithm for the initiation and adjustment of therapy: a consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetes Care*. 2009;32(1):193-203.
12. Watkins JB, Minshall ME, Sullivan SD. Application of economic analyses in U.S. managed care formulary decisions: a private payer's experience. *J Manag Care Pharm*. 2006;12(9):726-735.
13. Goldman DP, Joyce GF, Zheng Y. Prescription drug cost sharing: associations with medication and medical utilization and spending and health. *JAMA*. 2007;298(1):61-69.
14. O'Kane ME. Performance-based measures: the early results are in. *J Manag Care Pharm*. 2007;13(2)(suppl S-b):S3-S6.
15. Dunn JD. Pharmacy management approach: how do we align all the incentives? *J Manag Care Pharm*. 2007;13(2)(suppl S-b):S16-S19.
16. Piette JD, Heisler M, Krein S, Kerr EA. The role of patient-physician trust in moderating medication nonadherence due to cost pressures. *Arch Intern Med*. 2005;165:1749-1755.
17. Butterworth SW. Influencing patient adherence to treatment guidelines. *J Manag Care Pharm*. 2008;14(6)(suppl S-b):S21-S25.
18. Roter DL, Hall JA. Communication and adherence: moving from prediction to understanding. *Med Care*. 2009;47(8):823-825.
19. Haskard Zolnierok KB, DiMatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. *Med Care*. 2009;47(8):826-834.
20. Medicare Part D Medication Therapy Management Programs (MTM): 2010 Fact Sheet. <http://www.cms.hhs.gov/PrescriptionDrugCovContra/Downloads/MTMFactSheet.pdf>. June 8, 2010. Accessed June 23, 2010.
21. Fleming WK. Pharmacy management strategies for improving drug adherence. *J Manag Care Pharm*. 2008;14(6)(suppl S-b):S16-S20.
22. Abelson R. UnitedHealth and I.B.M. test health care plan. *The New York Times*. February 6, 2009. [http://www.nytimes.com/2009/02/07/business/07medhome.html?\\_r=2](http://www.nytimes.com/2009/02/07/business/07medhome.html?_r=2). Accessed March 1, 2010.
23. Appleby J. Firms offer bigger incentives for healthy living. *USA Today*. January 20, 2009. [http://www.usatoday.com/news/health/2009-01-19-diabetes\\_N.htm](http://www.usatoday.com/news/health/2009-01-19-diabetes_N.htm). Accessed July 15, 2009.
24. Naydeck BL, Pearson JA, Ozminkowski RJ, Day BT, Goetzl RZ. The impact of the Highmark Employee Wellness Programs on 4-year healthcare costs. *J Occup Environ Med*. 2008;50(2):146-156.
25. Ralston JD, Hirsch IB, Hoath J, Mullen M, Cheadle A, Goldberg HI. Web-based collaborative care for type 2 diabetes: a pilot randomized trial. *Diabetes Care*. 2009;32(2):234-239.