

The Clinical and Economic Burden to Managed Care Organizations of Poor Medication Compliance in Cardiovascular Disease Risk and Diabetes, the role of MEMOTEXT



in association with



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Summary: The clinical and economic burdens of patient non-compliance are well established, driven by broad chronic disease states such as cardiovascular diseases and diabetes. The economic impact of patient non-compliance is borne by managed care organizations through wasted pharmacy dispensing and the additional costs incurred from poor clinical outcomes. Adding to this cost is the lost opportunity to improve Medicare STAR ratings and PPACA identified quality measurements, several of which are specific to management of diabetes and hypertension, where patient compliance is a considerable challenge.

Patient non-compliance has multiple rationales. Health systems have tried different modalities to improve compliance, but historical efforts have resulted in limited success. Traditional compliance improvement modalities are either not individualized to the patient or are not economically feasible for large populations. Improving medication compliance through the use of technology integrated with behavioral health evidence has advanced to engage individual patients and personalized compliance communications are a solution. One technology is the MEMOTEXT Personalized Adherence Solutions, addressing the unmet need to individualize patient communication with proven results.

Economic burden of poor medication compliance

It is well established that the healthcare system bears a tremendous financial strain due to patient non-compliance to prescribed pharmacologic treatments.

Commonly cited data include:

- ~\$290 billion for avoidable medical treatment due to nonadherence¹
- > \$100 billion spent each year on avoidable hospitalizations²

A fundamental driver of the high cost of nonadherence is the broad prevalence of complicated and costly chronic diseases. Chronic disease treatment represents 75% of US healthcare costs¹. Over 50% of the U.S. population suffers from at least one chronic disease, with cardiovascular risk patients and diabetes particularly burdensome.

Causes of non-compliance

Medication compliance is complicated to address due to the multiple root causes. Primary reasons vary among patients and may be intentional or non-intentional. Patient population and disease state characteristics further blur the understanding of non-compliance drivers.

The research has identified multiple causes of non-compliance:

Causes of non-compliance^{2,3}	
Cost/Access	<ul style="list-style-type: none"> ▪ High medication costs ▪ Lack of social support
Lack of coordination in patient care	<ul style="list-style-type: none"> ▪ Poor patient-provider relationships
Lifestyle, patient psychology, health literacy, demographics	<ul style="list-style-type: none"> ▪ Asymptomatic disease ▪ Mental health disorders ▪ Complex treatment scheme ▪ Patient limitations (physical, psychological, or cognitive impairments) ▪ Age, race
Medication side effects	<ul style="list-style-type: none"> ▪ Negative/severe side effects

Patient compliance in cardiovascular disease risk

Non-compliance in cardiovascular disease patients is especially troubling to managed care organizations. Non-compliance by these patients leads to re-hospitalizations and avoidable additional required medical care. The data demonstrate a disturbing pattern of non-compliance in very high-risk and costly patients:

- Following an acute myocardial infarction, 24% of patients did not fill the prescribed cardiac medication within one week of discharge³
- 34% of patients with acute MI prescribed aspirin, statin and β-blockers stopped at least 1 medication and 12% stopped all 3 medications within 1 month of hospital discharge³

- 50% of patients prescribed antihypertensive medications had stopped taking them within one year of the initial prescription³

The expense of a drug dispensed but not taken is considerably more burdensome than the wasted pharmacy expenditure. The patient non-compliance issue has a dramatic effect on negative outcomes and increased costs:

- A lack of adherence to CV medication is strongly associated with adverse cardiac events such as coronary heart disease, MI, and stroke among patients with CAD³
- A lack of adherence to statins in the year after hospitalization for MI was associated with 12-25% increased relative hazard for mortality³
- For the chronic CAD patient, nonadherence to medications (β -blockers, statins, and/or ACE) was associated with 10-40% relative increased in risk of CV hospitalizations and a 50-80% relative increase in risk of mortality³
- Poor adherence to heart failure drugs has been shown to be associated with an increased number of CV-related emergency department visits³
- Adherence to antihypertensive medications is associated with significantly lower total annual healthcare costs, \$7,182 for those with MPR >80% compared to \$7,995 with MPR <60%, an 11% increase⁴

Patient compliance in diabetes

Patient compliance in diabetes is often cited as the most challenging issue in

disease management for payers and providers. The complex nature of diabetes care and the need to individualize treatment led the ADA and EASD to develop “A Patient Centered Approach” in the 2012 position statement on the management of hyperglycemia. The position statement comments *“Ultimately, it is patients who make the final decisions regarding their lifestyle choices and, to some degree, the pharmaceutical interventions they use; their implementation occurs in the context of the patients’ real lives....”*⁵

The data shows the non-compliance by patients with diabetes has profound cost to the health care system. Importantly, and offering considerable support to invest to improve compliance are the recent data have proving the reduced costs of patients with better adherence.

- Patients with medical possession ratios less than 80% had 2.5 times the risk of hospitalization for reasons either directly related to diabetes or to cardiovascular disease⁶
- Increased antidiabetic MPR was the strongest predictor of decreased total annual healthcare costs, 8.6% to 28.9% decrease in annual total healthcare costs in annual total healthcare costs for every 10% increase in MPR⁷
- Each additional prescription fill by users of older (metformin or SFU) antidiabetes agents reduced hospitalization risk by 0.3%, reduced the number of hospital days by 0.04 days, and reduced Medicare spending

by \$71 per refill⁸

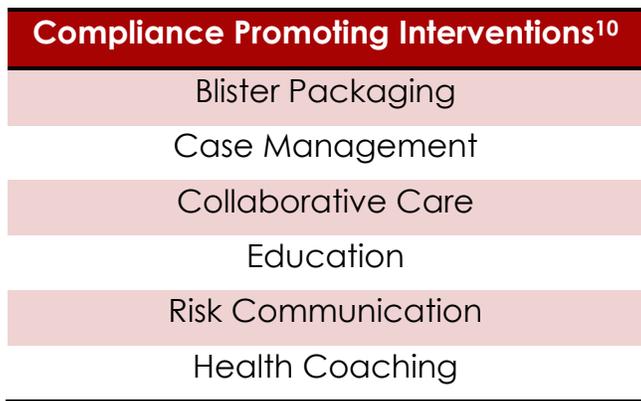
Medication compliance and quality care delivery

The economic incentive for a managed care organization to invest and improve patient compliance is well established, and growing with the advent of Accountable Care Organizations. CMS has recognized the importance of medication compliance for some time, and has linked to the Medicare STAR system. Three metrics of the STAR rating system are directly related to adherence of hypertension, statins and oral antidiabetic agents, and are weighted heavily due to their direct impact on health care spending. These three measures are weighted to account for 11% of a Medicare sponsor's score. The implementation of Accountable Care Organizations has underscored the importance of patient adherence as well. *Health Affairs* estimates that 20 of the 33 quality measures for ACOs are related to safe and effective use of medications, although the administration of pharmacy benefit is distinct from ACOs.⁹

Historical attempts to improve patient adherence

Uni-modal interventions, such as reduced daily dosage or package simplification have resulted in limited success, due to multi-factorial nature of the problem. Patient out-of-pocket burden is linked to medication compliance, although data indicates that even when patient cost shares are eliminated, patient utilization remained at only 60%³. Greater promise has been

demonstrated with multimodal interventions such as increasing adherence to diabetes treatment with tele-monitoring and weekly nurse feedback^{3h, 3i}. One consistent feature of successful programs has been regular follow-up from the healthcare system (physician, nurse, or pharmacist), however the logistical challenges of these multimodal programs and the required involvement of healthcare personnel make these solutions difficult to scale to a large population.



In cardiovascular risk patients, data have shown that the more resource intensive the compliance intervention, the greater the improvement in compliance³.

Intervention	Informational Mailers	Pharmacist-led Intervention	Multi-pronged approach: education, reminders, and frequent clinic visits (every 2 months)
Compliance Improvement	4.3%	10.9%	~40%

Resource Intensity of Compliance Intervention

The challenge to health systems and managed care organizations is to address patient medication compliance that is scalable to a broad population without demanding unsustainable resources.

Role of technology

The implementation of technologies to address the medication compliance challenge has been emerging for several years. Similar to previous interventions attempted, there have been uneven rates of success implementing various uni-modal technologies such as patient reminders, auto-calls and mailers. Patient behavior is complex and requires any technology adopted to be predictive of patient complexities and dynamic to adjust to changing patient attitudes.

To address patient adherence requires the use of proven screening and assessment tools to identify and target the patients who are at the greatest risk. Methodologies leveraging technology and focused on understanding the patients' attributes, tailoring interventions have proven to be considerably more successful than uni-modal approaches.

MEMOTEXT Personalized Adherence Solutions

The MEMOTEXT approach is patient specific and interactive, involving a unique multi-stakeholder collaborative model to maximize patient compliance

Assessment tools predict a patient's proclivity to adhere to treatment and technology personally tailors adherence strategies to fit each patient.

MEMOTEXT adjusts communication with patient in real time based on various parameters affecting adherence and tailors patient messaging, delivered via mediums selected by the patient to promote patient adherence.

By applying widely-accepted risk, literacy and behavioral assessment tools, MEMOTEXT learns about an individual patient's barriers to medication compliance in the context of the patient's condition, allowing for the creation of an effective medication compliance program tailored to the needs of the patient.

Through the unique Personologic® engine, MEMOTEXT understands on an ongoing basis what the barriers are for an individual over time, as the reasons for patient behavior change over time. Internal research shows that highly personalized and dynamic approaches are most effective to overcome medication non-compliance. By understanding factors such as the individual's learning style, health literacy level, depressive symptoms and stage of change, information tailored to that individual can be given.

MEMOTEXT focuses specifically on variables that can be affected by intense, iterative and interactive communications and by employing scalable solutions, using technologies that are easy to use and understand by both patient and health care system.

MEMOTEXT results in diabetes

MEMOTEXT implementation in a diabetic population has shown profound continued patient response and improved adherence. The MEMOTEXT methodology has proven to increase patient compliance by a substantial percentage in a diabetes patient program.¹¹

Effect on Medication Possession Ratios 3X daily regimen medications	Average Change in Total Number of Dispensed Records %
High Medication Possession Rate (MPR) >80%	+ 1.5 - 3%
Medium MPR 33% to 80%	+20%-25%
Low MPR <33%	+50%

CONCLUSION

Patient medication compliance is complex and costly across many disease states, in particular cardiovascular and diabetes. Personalized approaches are demanded to improve adherence and consequently reduce health care costs, but the solution must be scalable to address the large disease states that drive the majority of health care expense in managed care organizations and impact quality performance ratings. The MEMOTEXT Personalized Adherence Solution addresses these needs.

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