Editorial

Copayment Levels and Medication Adherence
Less Is More

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Statins play a central role in cardiovascular risk reduction. Their benefit has been demonstrated for a broad spectrum of patients, ranging from those without known vascular disease[1] to those who have recently had a myocardial infarction [2] or have undergone coronary artery bypass surgery.[3] Not surprisingly, statins are the most widely sold class of drugs in the United States, accounting for $18.4 billion in sales in 2007.[4]

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Despite this, fewer than half of the people who qualify for lipid-modifying treatment receive it.[5] Furthermore, only half of all patients who have been prescribed a statin actually adhere to this therapy. For example, 42% of Medicare patients enrolled in a pharmacy benefit program were adherent with their prescribed statin 2 years after starting treatment.[6] Statin adherence rates after acute coronary syndrome do not appear to be much better,[7] nor have they improved substantially over time.[8] Not surprisingly, nonadherence is a central reason why many patients do not achieve their low-density lipoprotein goals,[5] and patients who are nonadherent have worse clinical outcomes[9] and higher healthcare costs[10] than their adherent counterparts.

The reasons for statin nonadherence are complex and vary from patient to patient. For some, side effects lead them to a legitimate discontinuation of therapy. Others misunderstand the importance of statin therapy because of the asymptomatic nature of hyperlipidemia, especially when burdened with the complex treatment regimens that many patients with vascular disease receive. Unfortunately, for an increasing number of patients, cost is a substantial barrier to appropriate medication use.

A study in this issue of *Circulation* makes this point clearly.[11] Using a difference-in-difference approach, Doshi et al evaluated the impact of an increase in statin copayments (from $2 to $7 per 30-day prescription) among patients in the Veterans Affairs system. They found that this copayment change was associated with a 7% greater decline in adherence and a 12% greater increase in having a 90-day gap in therapy than observed for veterans whose copayments remained unchanged. Most important, these results were observed in all of the subgroups that were evaluated, including patients at high risk of coronary artery disease–related events.

Although Doshi et al[11] studied a population of patients who may be particularly sensitive to relatively small absolute changes in copayment levels, their results are very consistent with those from other healthcare environments[10,12–14] (Table) and with studies evaluating the relationship between high patient cost sharing and nonadherence for other drug classes.[15] Collectively, these data demonstrate that copayments, which are intended to reduce the use of less important or "discretionary" services by making patients responsible for part of their cost, also adversely affect the use of therapies that may be considered "essential."

These observations lead to a logical strategy: We should reduce (not increase) copayments for this and other evidence-based therapies in high-risk patients. This approach is sometimes known as value- or evidence-based insurance design,[16] because it proposes to base patient copayments on both the efficacy and the cost of a treatment, not just its cost. Of course, deciding what magnitude of efficacy is large, or similarly determining for whom statins might be considered essential, is a matter of some debate. Nevertheless, strategies such as this are part of a larger movement from payers and patients to receive quality and value in health care through a more rational, evidence-based allocation of resources. The selective reduction of copayments for medications such as statins has gained particular attention because the cost savings from clinical events that are prevented by the greater use of effective medications may offset the added costs of assuming patients' copayments.

Although limited, the existing data provide an estimate of the impact that reducing copayments for statins might have. A prospective study involving 1 large employer found that reducing statin copayments increased adherence by 3 percentage points.[17] An analytic model suggests that eliminating statin copayments for high-risk (higher-value) patients and raising them for lower-risk (lower-value) patients could prevent approximately 80 000 hospitalizations and 30 000 emergency department admissions and save $1 billion per year in the United States.[10] Analyses in post–myocardial infarction patients show similar results.[18,19] More robust data will come for the ongoing Post-MI FREEE trial (Post–Myocardial Infarction Free Rx Event and Economic Evaluation), which is randomizing post–myocardial infarction patients to no copayments or usual insurance coverage for

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Table. Selected Studies Evaluating the Impact of Copayment Differences and Statin Use and Adherence

First Author	Study Design	Subjects	Copayment Levels Compared		Statin Use Among Patients With Lower (vs Higher) Copayments
			Higher (Less Generous)	Lower (More Generous)	
Huskamp[12]	Pre-post comparison	Employees of company that changed their drug benefits (and a control company)	3-Tier drug plan ($30 copay for brand-name drugs)	1-Tier drug plan ($7 copay for brand-name drugs)	10% More likely to discontinue therapy
Goldman[10]	Cross-sectional study	Employees of 25 companies enrolled in 88 health plans	$20 Copay	$10 Copay	6% to 10% Less likely to be fully adherent
Gibson[13]	Cross-sectional study	Patients with employer-sponsored health coverage	$20 Copay*	$10 Copay	2% to 3% Less likely to be fully adherent
Schneeweiss[14]	Cohort study	Residents of British Columbia (with historical controls)	$10-$25 Copay†	$0 Copay	5% Less likely to be fully adherent
Doshi[11]	Interrupted time-series analysis	Veterans Affairs beneficiaries	$7 Copay	$2 Copay	7% Greater decline in statin adherence

*This study evaluated copayments as a continuous variable and estimated the impact of a $10 copayment differential across the range of observed values.
†Copayments were income based.

statins and other secondary prevention medications, but results from this trial will not be reported for several years.[20]

While we await better evidence, there are still important lessons to learn from the results of the present study by Doshi et al.[11] First, it is important to simply recognize the relationship between cost and nonadherence. This problem is likely to become even more important as the amount of cost sharing faced by patients continues to increase and the economy continues to suffer. These are issues that physicians seldom think about and even less commonly discuss with patients but which clearly confound the clinical objectives that we work hard to achieve and on which, in some cases, our salaries are based. In response, we can educate ourselves about medication costs, we can discuss them with our patients, and we can advocate for the use of equally effective but lower-cost medications when clinically appropriate.

Second, at a macro level, policymakers working for insurers, government payers, and large employers should reconsider efforts to constrain rising costs by raising patient cost sharing for essential medications; these efforts may actually increase overall healthcare costs and therefore frustrate, not further, their intended goals. When setting statin copayments for high-risk patients, less is almost certainly more.

Finally, and perhaps most importantly, the results presented by Doshi et al[11] highlight just how common and complex nonadherence is. In this study, rates of nonadherence among veterans without any cost sharing (ie, those who receive their medications for free) were still almost 40%. Said another way, once we have dealt with cost-related underuse, we must still address the numerous other reasons for statin nonadherence. This is not different from the problem that statins themselves are used to treat; they are only part of a multifaceted regimen for cardiovascular risk reduction. The identification of statins has helped stem the tide of cardiovascular morbidity and mortality. Identifying how to improve adherence will no doubt help even more.

Disclosures

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References

1. Thavendiranathan P, Bagai A, Brookhart MA, Choudhry NK. Primary prevention of cardiovascular diseases with statin therapy: a meta-analysis of randomized controlled trials. *Arch Intern Med*. 2006;166:2307–2313.
2. Cannon CP, Braunwald E, McCabe CH, Rader DJ, Rouleau JL, Belder R, Joyal SV, Hill KA, Pfeffer MA, Skene AM. Intensive versus moderate lipid lowering with statins after acute coronary syndromes. *N Engl J Med*. 2004;350:1495–1504.
3. Kulik A, Brookhart MA, Levin R, Ruel M, Solomon DH, Choudhry NK. Impact of statin use on outcomes after coronary artery bypass graft surgery. *Circulation*. 2008;118:1785–1792.
4. IMS Health. Top Therapeutic Classes by U.S. Sales. Available at: http://www.imshealth.com/portal/site/imshealth/menuitem.a46c6d4df3db4b3d88f611019418c22a/?vgnextoid=936d9df4609e9110VgnVCM10000071812ca2RCRD&cpsextcurrchannel=1. Accessed October 24, 2008.
5. Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report. *Circulation*. 2002;106:3143–3421.
6. Benner JS, Glynn RJ, Mogun H, Neumann PJ, Weinstein MC, Avorn J. Long-term persistence in use of statin therapy in elderly patients. *JAMA*. 2002;288:455–461.
7. Jackevicius CA, Mamdani M, Tu JV. Adherence with statin therapy in elderly patients with and without acute coronary syndromes. *JAMA*. 2002;288:462–467.
8. Choudhry NK, Setoguchi S, Levin R, Winkelmayer WC, Shrank WH. Trends in adherence to secondary prevention medications in elderly post-myocardial infarction patients. *Pharmacoepidemiol Drug Saf*. 2008;17:1189–1196.
9. Rasmussen JN, Chong A, Alter DA. Relationship between adherence to evidence-based pharmacotherapy and long-term mortality after acute myocardial infarction. *JAMA*. 2007;297:177–186.
10. 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.
11. Doshi JA, Zhu J, Lee BY, Kimmel S, Volpp KG. Impact of a prescription copayment increase on lipid-lowering medication adherence in veterans. *Circulation*. 2009;119:390–397.
12. Huskamp HA, Deverka PA, Epstein AM, Epstein RS, McGuigan KA, Frank RG. The effect of incentive-based formularies on

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prescription-drug utilization and spending. *N Engl J Med*. 2003;349:2224–2232.
13. Gibson TB, Mark TL, Axelsen K, Baser O, Rublee DA, McGuigan KA. Impact of statin copayments on adherence and medical care utilization and expenditures. *Am J Manag Care*. 2006;12:SP11–SP19.
14. Schneeweiss S, Patrick AR, Maclure M, Dormuth CR, Glynn RJ. Adherence to statin therapy under drug cost sharing in patients with and without acute myocardial infarction: a population-based natural experiment. *Circulation*. 2007;115:2128–2135.
15. Goldman DP, Joyce GF, Zheng Y. Prescription drug cost sharing: associations with medication and medical utilization and spending and health. *JAMA*. 2007;298:61–69.
16. Fendrick AM, Smith DG, Chernew ME, Shah 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.
17. Chernew ME, Shah MR, Wegh A, Rosenberg SN, Juster IA, Rosen AB, Sokol MC, Yu-Isenberg K, Fendrick AM. Impact of decreasing copayments on medication adherence within a disease management environment. *Health Aff (Millwood)*. 2008;27:103–112.
18. Choudhry NK, Patrick AR, Antman EM, Avorn J, Shrank WH. Cost-effectiveness of providing full drug coverage to increase medication adherence in post–myocardial infarction Medicare beneficiaries. *Circulation*. 2008;117:1261–1268.
19. Choudhry NK, Avorn J, Antman EM, Schneeweiss S, Shrank WH. Should patients receive secondary prevention medications for free after a myocardial infarction? An economic analysis. *Health Aff (Millwood)*. 2007;26:186–194.
20. Choudhry NK, Brennan T, Toscano M, Spettell C, Glynn RJ, Rubino M, Schneeweiss S, Brookhart AM, Fernandes J, Mathew S, Christiansen B, Antman EM, Avorn J, Shrank WH. Rationale and design of the Post-MI FREEE trial: a randomized evaluation of first-dollar drug coverage for post-myocardial infarction secondary preventive therapies. *Am Heart J*. 2008;156:31–36.

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