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THE LEONARD DAVIS INSTITUTE of HEALTH ECONOMICS

RESEARCH BRIEF
2016 - No. 1

Effect of Financial Incentives to Physicians, Patients, or Both on Lipid Levels: A Randomized Clinical Trial

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Journal of the American Medical Association, Volume 314, Number 18

KEY FINDINGS:

Can financial incentives be used to reduce cholesterol levels in high-risk patients? This randomized trial says modest reductions can be achieved only by targeting incentives to both patients and physicians, not to one or the other.

THE QUESTION

To whom should financial incentives be targeted to achieve a desired clinical or health outcome? Physician and patient incentives are becoming more common, but they are rarely combined, and effectiveness of these approaches is not well-established. Using insight from behavioral economics, a research team led by LDI Senior Fellows David Asch and Kevin Volpp sought to determine whether physician financial incentives, patient incentives, or shared physician and patient incentives are more effective in promoting medication adherence and reducing cholesterol levels of patients at high risk for cardiovascular disease.

THE STUDY

The researchers randomly assigned 340 primary care physicians (PCPs) from three large primary care practices in the northeastern United States to one of four study groups: control, physician incentives, patient incentives, and shared physician-patient incentives. More than 1,500 patients, all at high risk of cardiovascular disease, participated and were allocated to the same group as their PCP.

Patients received their prescribed daily dose of statins in an electronic pill bottle, which, when opened, wirelessly transmitted a signal to a web platform.

Each patient in the three intervention groups was assigned a quarterly goal to reduce lipoprotein cholesterol (LDL-C) levels, which should have been achievable if the patient was fully adherent to his or her prescribed medication.

PCPs in the physician incentives group accrued quarterly payments of \$256 for each enrolled patient who met the quarterly goal, paid semi-annually. PCPs in the patient incentives group received no payments; instead, their patients participated in an automatic daily lottery with eligibility based on having taken the statin the day before. PCPs and patients in the shared incentives group followed the same incentive structure as in the PCP or patient-specific groups but with payments of half the size. Total possible payouts were the same for all incentive groups. Physicians and patients in the control group received no goal-based incentives, but all participants received small participation payments. The interventions continued for 12 months, and patients were followed up for an additional three months.

THE FINDINGS

Only patients in the shared physician-patient incentives group achieved reductions in LDL-C levels statistically different from those in the control group.

RESULTS Only patients in the shared physician-patient incentives group achieved reductions in LDL-C levels statistically different from those in the control group (8.5 mg/dL; 95% CI, 3.8-13.3; $P = .002$). For comparison of all 4 groups, $P < .001$.

Low-Density Lipoprotein Cholesterol Level	Incentives Group			
	Shared	Physician	Patient	Control
Mean reduction (95% CI), mg/dL	33.6 (30.1-37.1)	27.9 (24.9-31.0)	25.1 (21.6-28.5)	25.1 (21.7-28.5)
Baseline, mg/dL	160.1	159.9	160.6	161.5
12 Months, mg/dL	126.4	132	135.5	136.4

Source: JAMA. 2015;314(18):1926-1935. doi:10.1001/jama.2015.14850

After 12 months of the intervention, 49% of patients in the shared physician-patient incentives group had achieved their LDL-C goal compared with 40% in physician incentives, 40% in patient incentives, and 36% in control.

Although medication adherence was higher in the shared incentive and patient incentive groups, it was low across all the groups. However, patients who were already taking statins before the start of the study (less than half of participants) showed large increases in adherence with incentives. This suggests that the incentive was ineffective in promoting initiation of statin use in patients but effective in increasing adherence among those already taking statins.

THE IMPLICATIONS

This trial is the first of its kind to thoroughly test physician, patient, and shared incentives of equivalent value, and is notable for incorporating several insights from behavioral economics: daily engagement, “regret” lotteries, a relatively high probability of a small reward and lower probability of a larger reward, and leveraging of loss aversion.

These findings are important for what they reveal about what works and what does not work. Neither physician nor patient incentives on their own lowered the LDL-C level significantly more than the control. The lack of effect of the physician-only intervention offers the first controlled evidence that adding these incentives to a fee-for-service payment model may not improve medication-related intermediate outcomes. The authors suggest that the effectiveness of the shared incentives model makes sense with the LDL-C reduction likely driven by both provision

of medication by PCPs and patient adherence to that medication.

While the study points to the incentive structure that had the greatest relative impact, the improvements were modest and the authors stress that further information is needed to understand whether the approach represents good value. Further, one limitation of the study was a lack of a true “usual-care” control that did not receive electronic pill bottles. Patients in the control group received electronic pill bottles and may have been more adherent than is typical because they were under observation. Other limitations include a relatively small number of enrolled patients per physician, which limited the potential rewards for physicians and may have reduced their motivation to go after these awards.

Asch DA, Troxel AB, Stewart WF, et al. [Effect of Financial Incentives to Physicians, Patients, or Both on Lipid Levels: A Randomized Clinical Trial.](#) JAMA. 2015;314(18):1926-1935. doi:10.1001/jama.2015.14850.

LEAD AUTHORS



David Asch is Executive Director of the [Penn Medicine Center for Innovation](#). Dr. Asch’s research aims to understand the clinical and economic decisions patients and providers make.



Kevin Volpp is founding Director of the [Center for Health Incentives and Behavioral Economics at LDI \(LDI CHIBE\)](#), which explores how the science of behavioral economics can improve health. Dr. Volpp’s research program focuses on the impact of financial and organizational incentives on health outcomes.



Andrea Troxel is Director of Biostatistics at LDI CHIBE. Dr. Troxel is an expert on statistical methodology in the areas of missing data, longitudinal studies, and clinical trials.



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