

Employer-Led Efforts to Improve the Value of Health Spending

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ABSTRACT

OBJECTIVES: Employers have a major stake in improving the value of health spending. Our objective was to assess existing evidence on the impact of employer-led efforts to lower costs and improve or maintain quality.

STUDY DESIGN: Systematic literature review.

METHODS: We searched MEDLINE, Business Source Premier, PAIS, ABI Inform Global, and the Grey Literature Report for articles, published through June 2015, that evaluated the impact of employer-led strategies to lower costs and improve or maintain healthcare quality or health outcomes. We limited our focus to randomized controlled trials and longitudinal observational studies with concurrent control groups. Data on the employers, interventions, research designs, and outcomes were extracted.

RESULTS: Twelve articles met our inclusion criteria. The most common interventions were medication therapy management (4 articles), reductions in prescription drug co-payments for certain chronic conditions (3 articles), and managed care for physical and/or mental health (2 articles). Four studies reported cost reductions for employers. Among those 4 studies, 2—both medication therapy management interventions—also showed improvement on quality measures.

CONCLUSIONS: There are few studies with rigorous designs that have evaluated employer-led efforts to improve the value of health spending. Despite employers' interest in improving the value of health spending, their efforts to date have produced few promising strategies for use by purchasers in the public or private sectors.

There is ample evidence showing the United States spends nearly twice as much per capita on healthcare as other industrialized countries, yet health outcomes in the United States are no better.¹⁻³ As a result, many researchers, policy makers, and healthcare leaders conclude that the value of health spending in the United States is low.⁴ In an effort to improve the value of health spending, the CMS has initiated a number of programs that base provider reimbursement, at least in part, on performance measures.^{5,6} However, early data suggest that these value-based purchasing programs in the public sector have shown little or no success.^{7,9}

Private sector efforts to improve the value of healthcare have received less attention. As the largest purchasers of healthcare, employers have a major stake in improving the value of health spending.^{10,11} Their interest in supporting high-value healthcare stems from a desire to keep the costs of employee benefits low, as well as the need to cultivate a healthy workforce with limited absenteeism, high productivity, and longevity. As a result, employers—particularly, large self-insured employers—have a tremendous incentive to adopt policies and implement care models aimed at improving the value of healthcare.

A number of articles in the academic and lay press have described employers' efforts to reduce costs, which range from simple workplace wellness programs to more complex efforts designed to alter local delivery systems.¹²⁻¹⁴ Previous reviews have examined the impact of wellness programs and reductions in co-payments for prescription drugs.¹⁵⁻¹⁷ However, to date, there has not been a comprehensive assessment of employers' efforts to improve the value of health spending. As a result, employers may be making benefit decisions with relatively limited evidence, and lessons for improving the value of health

spending from the private sector may not be reaching public purchasers. Our purpose was to systematically review the evidence of the impact of employer-led efforts to improve the value of health spending.

METHODS

Inclusion and Exclusion Criteria

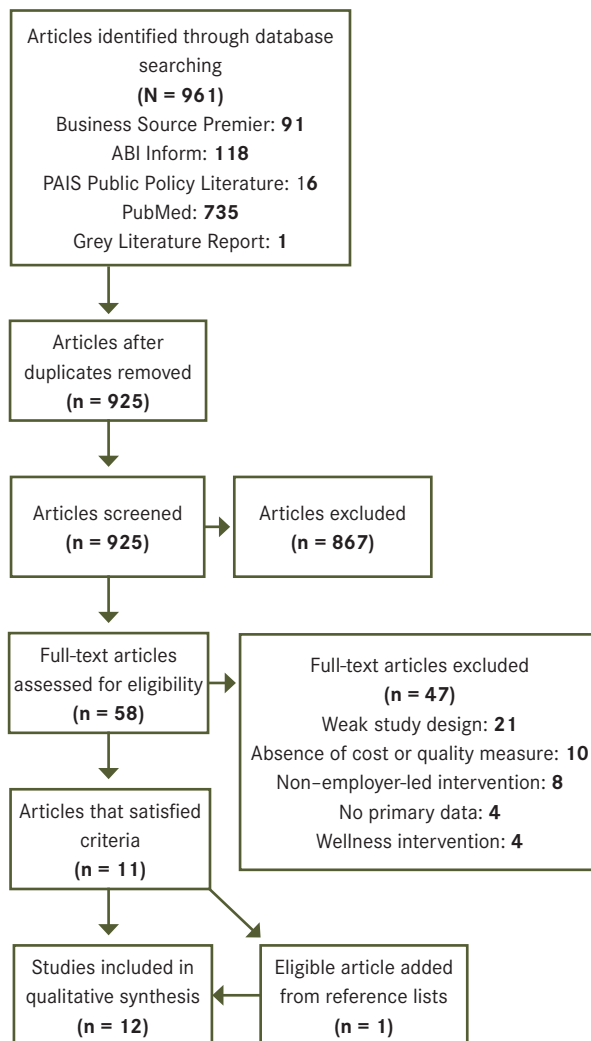
We limited our review to articles that empirically tested the impact of an employer-led intervention on the value of health spending—value of health spending refers to quality in relation to the cost of care.^{18,19} Value can increase by improving quality of services while keeping costs constant, or by lowering costs and achieving the same level of quality. Although there is currently no standard approach for measuring the value of health spending,^{20,21} there is general agreement that costs and quality should be assessed through separate outcome measures.¹⁹ Therefore, we limited our search to articles that contained both cost and quality outcome measures. Cost assessments could include measures related to financial outlays (eg, lower premiums), utilization (eg, hospital admissions), or productivity (eg, absenteeism). Quality assessments could include process measures (eg, receipt of recommended care), measures related to adherence (eg, prescriptions filled), measures related to health outcomes and health status (eg, health risk group), and measures of patient experience and satisfaction.

We excluded articles where the only employer-led intervention was a wellness initiative—defined as a program that supports employees in understanding their health risks and adopting healthy behaviors to decrease health risk.¹⁵ Examples of wellness interventions include health risk assessments and screenings, lifestyle management, and behavioral health programs. These articles were excluded because other systematic reviews have described the impact of employer-led wellness interventions.^{15,17} We excluded articles that did not have a control group, as well as articles that did not control for confounding variables, either by design (eg, randomized controlled trials, propensity score matching) or statistical methods (eg, inclusion of control variables for age, race, sex). Therefore, our articles were limited to randomized controlled trials and longitudinal observational studies with concurrent control groups. We also excluded editorials, meeting abstracts, studies not published as full reports, articles focused on interventions conducted outside the United States, and articles focused on interventions mandated by state or federal law (eg, mental health parity).

Study Identification and Selection

In June 2015, a research librarian (LO) conducted systematic searches in PubMed MEDLINE (1940s-2015), Business Source Premier (1886-2015), Public Affairs Information Service – PAIS (1915-2015), and ABI Inform Global (1971-2015), with no date or language limits, using search terms for employers, costs, and quality. The searches combined permutations of the following terms using the Boolean operators AND and OR: health benefit plans, employer-sponsored, employer-based, self-insured, self-insurance, costs, utilization, absenteeism, sick days, hospitalization, admission, emergency, health status, health behavior, satisfaction, as well as a number of conditions of interest. The Grey Literature Report was also

Figure. Study Flow Diagram



searched. See the **eAppendix** (available at www.ajmc.com) for a complete list of the search strategies for each database.

Two reviewers (MM and CRM) independently screened the titles and abstracts of each unique article for concordance with the inclusion and exclusion criteria. When both reviewers identified discordance, studies were discarded. The full text of the remaining articles were retrieved for further critical appraisal regarding eligibility by the 2 reviewers, and again, studies were discarded when both reviewers identified discordance with the inclusion and exclusion criteria.

Data Extraction

Each article selected for inclusion was independently reviewed by 2 reviewers who were responsible for extracting several data elements following a standardized extraction form. Data elements included the industry, size, and location of the employer; characteristics of the intervention; study design; and cost and quality outcomes. Many studies included multiple measures of cost and quality. Because we

Table 1. Employer and Intervention Characteristics

Characteristic	N
Company/intervention location	
Southeast	3
Midwest	2
West	1
Northeast	1
Unknown	5
Industry description	
For-profit, private organization	4
University	3
Government/military	3
Unknown	2
Intervention	
Medication therapy management	4
Managed care for physical and/or mental health	2
Reduced co-payments for prescription drugs related to chronic illness	3
Increased co-payments for brand-name drugs	1
Capitation for primary care with shared savings	1
High-deductible health plan with savings account/consumer-directed health plan	1

were most interested in the financial implications to the employers, we reported on the changes in costs to employers in our results; we only reported changes in utilization if no cost data were provided. All quality measures included in the studies are reported in our results. Finally, the reviewers identified additional candidate studies by reviewing the reference lists of the included articles.

RESULTS

The literature search produced 925 unique candidate articles, of which 58 were selected for full text review (Figure). After full text review, an additional 47 articles were excluded, with the most common reasons being weak study design (ie, no control group or no controls for confounding variables), absences of a cost or quality outcome measure, and the intervention was not employer-led. Eleven articles satisfied all criteria, and 1 additional article was added after reviewing the reference lists. In all, 12 articles were included in the review.

Characteristics of the Employers and Interventions

Of the 12 studies, 5 provided information on the number of employees or covered lives (employees and dependents). All 5 were large organizations, ranging from just over 13,000 total covered lives to just over 42,000, including dependents aged under 18 years. Seven studies reported the location of the organization's headquarters or

intervention site; there was considerable diversity across the United States. (Table 1). All but 2 studies reported information about the employer's industry. Four employers were private, for-profit organizations, 3 were universities, and 3 were government or military.

The interventions varied substantially. Four employers introduced medication therapy management (MTM) programs where patients met one-on-one with a pharmacist and received individualized services focused on reconciling medication regimens, preventing adverse events, identifying significant medication interactions and missing essential therapies, and improving adherence.²²⁻²⁵ Three employers reduced prescription drug co-payments for certain chronic conditions with the goal of improving adherence and health, and reducing more costly health services and overall health spending.²⁶⁻²⁸ Conversely, another employer increased prescription drug co-payments for brand-name drugs as an incentive to steer patients toward less expensive drugs.²⁹ Two employers introduced managed care, which encompassed a set of tools (eg, co-payments, utilization management) to improve coordination and efficiency of care.^{30,31} Another employer changed its reimbursement arrangements with primary care physicians, offering a capitated rate instead of fee-for-service, in an effort to get physicians to be more cost-conscious³²; the savings generated from capitation were shared with participating physicians. Finally, one employer introduced a high-deductible health plan, with the idea that greater exposure to the direct cost of their care would make employees more cost- and health-conscious.³³

Intervention Impacts

Table 2 provides a detailed description of the statistically significant ($P < .05$) outcomes from each study, organized by intervention type. Of the 4 studies reporting on MTM interventions, 2 reported lower medical costs and total healthcare costs for the employer.^{23,25} Of those 2 studies, one reported participants had higher medication possession ratios, a measure of adherence, and the other reported an increase in the percent of participants who achieved goals for blood pressure and body mass index, and clinical improvements in the stages of hypertension. One of the MTM studies showing no change in employer spending was the only randomized controlled trial in our sample.²⁴

Both of the managed care interventions resulted in higher costs to the employers,^{30,31} though unlike many of the other studies, the intervention costs were included in the analyses. In both studies, participants reported high satisfaction and better access to care. None of the 3 studies evaluating the reduced pharmacy drug co-payments for certain chronic conditions reported savings to employers, and improvements in quality measures were observed in 2 of the studies.^{27,28} However, the increased brand-name drug co-payment intervention resulted in lower drug costs for the employer and no change in use of drugs.²⁹

The study investigating capitation for primary care reported that the intervention resulted in lower charges and no change in blood pressure control.³² Finally, the study evaluating implementation of the high-deductible health plan showed mixed results regarding utilization, and although cancer screenings initially declined, there was no difference between the intervention and control groups after 4 years.³³

Table 2. Summary of Findings

Study	Year of Intervention Start	Longest Follow-up	Sample Size	Cost Outcomes	Quality Outcomes
Medication Therapy Management					
Christensen et al (2007) ²²	2004	6 months	Intervention = 67 Control 1 = 689 Control 2 = 870	There was no difference in insurer spending on prescription drugs or patient co-payments.	Greater than 80% of participants reported that they were satisfied or highly satisfied with the MTM and quality of the information provided. Pharmacists detected an average of 3.6 potential MTM problems per patient. ^a
Moore et al (2013) ²³	2007	1 year	Intervention = 2250 Control = 2250	Participants had lower plan-paid medical costs (-\$1,304 vs \$160) and total costs (-\$997 vs 62). The intervention ROI was 2.0.	Participants had higher medication possession ratios for hypertension and dyslipidemia, but not diabetes, depression, or asthma.
Shimp et al (2012) ²⁴	Unknown	1 year	Intervention = 128 Control = 128	There was no difference in employer spending on drug costs. Participants' OOP drug costs declined by an average of \$60 per year; controls did not.	No difference in medication adherence. Participants reported high satisfaction. ^a
Wittayanukorn et al (2013) ²⁵	2008	6 months	Intervention = 63 Control = 62	Participants had lower per-patient pharmacy expenditures (\$32 lower than controls), medical expenditures (\$326 lower than controls), and total direct expenditures (\$359 lower than controls). The intervention ROI was 1.67.	No differences in clinical outcomes (lipids, blood pressure, and BMI). The percentage of participants who achieved their goals for blood pressure and BMI increased, and clinical improvements in the stages of hypertension were observed.
Reduced Co-Payments for Prescription Drugs Related to Certain Chronic Illnesses					
Musich et al (2015) ²⁸	2010 - diabetes 2011 - hypertension	3 years - diabetes 2 years - hypertension	Diabetes: Intervention = 814 Control = 276 Hypertension: Intervention = 2674 Control = 580	There was no difference in employer-combined medical and pharmaceutical expenditures for diabetes or hypertension.	Participants had higher medication possession ratios for diabetes and hypertension.
Choudhry et al (2012) ²⁶	2006	1 year	Intervention = 2830 Control = 49,801	Pharmacy spending increased, but there was no difference in medical spending and total spending.	No change in coronary events or revascularization.
Gibson et al (2011) ²⁷	2005	3 years	Intervention = 25,065 Control = 25,065	There was no difference in prescription drug, medical, or total employer spending. Participants' OOP costs for prescription drugs declined by 7% over 3 years.	By year 3, adherence to asthma and CVD medications increased; no change in adherence for diabetes.
Managed Care					
Bickman (1996) ³⁰	1990	1 year	Intervention = 540 Control = 410	Participants had higher costs per treated child (\$7777 vs \$4904).	No difference in health outcomes. Participants had higher satisfaction, lower waits to first service (17 days vs 38 days), and lower dropout rates (9% vs 16%).
Zwanziger et al (2000) ³¹	1989	1 year	Intervention = 6768 Control = 7266	No difference in employer-paid average costs per beneficiary. Participants had lower OOP costs.	Participants reported higher satisfaction and fewer access problems.

(continued)

Table 2. Summary of Findings (continued)

Increased Co-Payments for Brand-Name Drugs					
Motheral et al (1999) ²⁹	1997	6 months	Intervention = 1112 Control = 1112	Participants had lower brand name and total drug costs.	No difference in use of or continuation with essential or discretionary chronic medications.
Capitation for Primary Care With Shared Savings					
Murray et al (1992) ³²	Unknown	1 year	Intervention = 99 Control = 66	Participants had fewer tests ordered and lower total medical charges.	No difference in blood pressure control.
High-Deductible Health Plan With Savings Account					
Fronstin et al (2013) ³³	2007	4 years	Intervention = 10,509 Control = 10,059	Participants had fewer physician office visits (decrease of 0.26 visits per year) and prescriptions filled (decrease of 0.85 prescriptions per year), but more emergency department visits (increase of 0.012 visits per year).	After 1 year, participants had lower rates of screening for breast, cervical, and colorectal cancer. But after 4 years, there was no difference in screening rates.

BMI indicates body mass index; CVD, cardiovascular disease; MTM, medication therapy management; OOP, out-of-pocket; ROI, return on investment.

*No comparison was made to the control group.

DISCUSSION

The results of our systematic review show few efforts by employers to improve the value of health spending, evaluate the results, and publish their findings. This is not surprising, however, given that health benefit design and reimbursement is not central to the core business of most employers. Even if employers initiate interventions aimed at improving value, they may not have the desire nor the resources to conduct methodologically rigorous evaluations and document the findings.

The limited number of articles meeting our inclusion criteria may also reflect a lack of emphasis among employers or evaluators on both the cost and quality implications of employer-led interventions. A number of news reports, employer surveys, and research studies have shown that employers are experimenting with different health benefit designs³⁴⁻³⁸; however, many evaluations of these efforts were excluded from our review because they did not include both cost and quality outcomes in their analyses.^{26,35} Given employers' long-standing and important role as healthcare purchasers, it is unfortunate that few lessons about improving value can be drawn from this sector. Further, employers experimenting with different ways to manage their health benefits are largely doing so without the benefit of strong evidence.

The most promising findings from our review relate to the MTM interventions. Two of the 4 studies reported cost savings and some indication of improved or maintained quality. MTM programs may be relatively easy for employers to implement since they do not require changes in contracts with providers (unlike initiating managed care or capitated payments) or changes to bargaining agreements with union employees (unlike changing co-payments). Although there is a cost associated with adding MTM services (eg, hiring a pharmacist),³⁹ both studies reported a positive return on investment. Still, our findings should be viewed with some caution. The longest follow-up among the studies was 1 year, so it is unclear whether the savings and improvements were maintained in the medium or long term.

Implications for Future Research

Our results align with findings from a previous systematic review of studies evaluating the effects of co-payment reductions: improved quality but no cost savings to employers.¹⁶ The limited evidence about employer-led strategies to improve the value of health spending highlights 2 opportunities for future work. First, there is an opportunity for further employer-led experimentation with interventions to improve the value of their health spending. The emphasis on value-driven purchasing, to date, has largely stemmed from public purchasers, for example, the Centers for Medicare and Medicaid Innovation's demonstration projects within the Medicare and Medicaid programs.^{40,41} Although many lessons from those demonstration projects may be applicable to the private sector, the Medicare and Medicaid programs support a different patient population than employers. Consequently, experimentation in both sectors is needed.

Second, there is potentially an opportunity for employer-researcher partnerships to help with evaluations of employer-led interventions. Researchers may help employers identify interventions, evaluate interventions, and bridge the gap between what is known and what is practiced. For example, previous reviews have shown that the impact of workplace wellness programs on cost and behavior changes is mixed at best,^{17,42} yet over half of large employers use them at a cost of almost \$600 per employee per year.⁴³ Researchers may help to bridge this divide between research evidence and decision making.

Limitations

Our systematic review has some limitations. First, our search results may be subject to publication bias, as successful interventions are more likely to be published.⁴⁴ Second, it is possible that employers are implementing and evaluating interventions to improve the value of their health spending, but their internal reports are not circulated in the public domain. Third, it is difficult to general-

ize our conclusions since the interventions were diverse, cost and quality outcomes were not uniformly operationalized, and effect sizes were not consistently reported.

CONCLUSIONS

Our systematic review found few rigorous evaluations of employer-led efforts to improve the value of healthcare spending. As a result, there are few evidence-based strategies for employers to consider to improve value of their spending. More employer-led experimentation, a greater focus on quality outcomes, and employer-researcher partnerships may help to expand the evidence base for interventions that improve the value of healthcare spending.

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REFERENCES

1. Woolf SH, Aron I, Panel on Understanding Cross-National Health Differences Among High-Income Countries; Committee on Population; Division of Behavioral and Social Sciences and Education; National Research Council; Board on Population Health and Public Health Practice; Institute of Medicine (eds). *U.S. Health in International Perspective: Shorter Lives, Poorer Health*. Washington, DC: National Academy Press; 2013.
2. OECD Health Statistics 2015. Organisation of Economic Cooperation and Development website. <http://www.oecd.org/els/health-systems/health-data.htm>. Accessed February 2015.
3. Squires D. Explaining high health care spending in the United States: An international comparison of supply, utilization, prices, and quality. The Commonwealth Fund website. <http://www.commonwealthfund.org/publications/issue-briefs/2012/may/high-health-care-spending>. Published May 3, 2012. Accessed April 3, 2015.
4. Curfman GD, Morrissey S, Drazen JM. High-value health care—a sustainable proposition. *N Engl J Med*. 2013;369:1163-1164. doi: 10.1056/NEJMe1310884.
5. Report to Congress: plan to implement a Medicare hospital value-based purchasing program. CMS website. <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/downloads/hospitalVBPplanRTCFinalsubmitted2007.pdf>. Published November 21, 2007. Accessed April 3, 2015.
6. Roadmap for implementing value driven healthcare in the traditional Medicare fee-for-service program. CMS website. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/Downloads/VBPRoadmap_OEA_1-16_508.pdf. Published 2008. Accessed April 3, 2015.
7. Ryan AM, Burgess JF Jr, Pesko MF, Borden WB, Dimick JB. The early effects of Medicare's mandatory hospital pay-for-performance program. *Health Serv Res*. 2015;50(1):81-97. doi: 10.1111/1475-6773.12206.
8. L&M Policy Research. Effect of pioneer ACOs on Medicare spending in the first year. CMS website. <https://innovation.cms.gov/Files/reports/PioneerACOEvalReport1.pdf>. Published November 3, 2013. Accessed April 4, 2015.
9. Kautter J, Pope GC, Lueng M, et al; RTI International. *Evaluation of the Medicare Physician Group Practice Demonstration: Final Report*. CMS website. <https://www.cms.gov/Medicare/Demonstration-Projects/DemoProjectsEvalRpts/Downloads/PhysicianGroupPracticeFinal-Report.pdf>. Published September 2012. Accessed April 1, 2015.
10. Reform in action: how employers can improve value and quality in health care. Robert Wood Johnson Foundation website. <http://www.rwjf.org/en/library/research/2013/01/how-employers-can-improve-value-and-quality-in-health-care.html>. Published January 2013. Accessed April 3, 2015.
11. US Census Bureau. *Current Population Survey, 2014 Annual Social and Economic Supplement*. Washington, DC: The US Census Bureau; 2014. <https://www.census.gov/hhes/www/poverty/publications/pubs-cps.html>. Accessed March 15, 2015.
12. Abelson R. Companies test plans to cut their health costs. *The New York Times* website. <http://www.nytimes.com/2014/03/07/business/companies-turn-to-private-exchanges-to-control-health-care-costs.html>. Published March 6, 2014. Accessed March 14, 2015.
13. Claxton G, Rae M, Panchal N, et al; Kaiser Family Foundation; Health Research & Educational Trust. Employer Health Benefits 2014 Annual Survey. Kaiser Family Foundation website. <http://files.kff.org/attachment/2014-employer-health-benefits-survey-full-report>. Published September 10, 2014. Accessed March 2, 2015.
14. Darling H. Health care reform: perspectives from large employers. *Health Aff (Millwood)*. 2010;29(6):1220-1224. doi: 10.1377/hlthaff.2010.0422.
15. Kaspian LC, Gorman KM, Miller RM. Systematic review of employer-sponsored wellness strategies and their economic and health-related outcomes. *Popul Health Manag*. 2013;16(1):14-21. doi: 10.1089/pop.2012.0006.
16. Lee JL, Maciejewski M, Raju S, Shrank WH, Choudhry NK. Value-based insurance design: quality improvement but no cost

- savings. *Health Aff (Millwood)*. 2013;32(7):1251-1257. doi: 10.1377/hlthaff.2012.0902.
17. Osilla KC, Van Busum K, Schnyer C, Larkin JW, Eibner C, Matke S. Systematic review of the impact of worksite wellness programs. *Am J Manag Care*. 2012;18(2):e68-e81.
 18. Tompkins CP, Higgins AR, Ritter GA. Measuring outcomes and efficiency in Medicare value-based purchasing. *Health Aff (Millwood)*. 2009;28(2):w251-w261. doi: 10.1377/hlthaff.28.2.w251.
 19. Porter ME. What is value in health care? *N Engl J Med*. 2010;363(26):2477-2481. doi: 10.1056/NEJMp1011024.
 20. Young PL, Olsen L, McGinnis JM. *Value in Health Care: Accounting for Cost, Quality, Safety, Outcomes, and Innovation: Workshop Summary*. Washington, DC: National Academies Press; 2010.
 21. Blumenthal D, Stremikis K. Getting real about health care value. *Harvard Business Review* website. <http://blogs.hbr.org/2013/09/getting-real-about-health-care-value/>. Published September 17, 2013. Accessed August 28, 2014.
 22. Christensen DB, Roth M, Trygstad T, Byrd J. Evaluation of a pilot medication therapy management project within the North Carolina State Health Plan. *J Am Pharm Assoc (2003)*. 2007;47(4):471-483.
 23. Moore JM, Shartle D, Faudskar L, Matlin OS, Brennan TA. Impact of a patient-centered pharmacy program and intervention in a high-risk group. *J Manag Care Pharm*. 2013;19(3):228-236.
 24. Shimp LA, Kucukarslan SN, Elder J, et al. Employer-based patient-centered medication therapy management program: evidence and recommendations for future programs. *J Am Pharm Assoc (2003)*. 2012;52(6):768-776. doi: 10.1331/JAPhA.2012.11186.
 25. Wittayanukorn S, Westrick SC, Hansen RA, et al. Evaluation of medication therapy management services for patients with cardiovascular disease in a self-insured employer health plan. *J Manag Care Pharm*. 2013;19(5):385-395.
 26. Choudhry NK, Fischer MA, Avorn JL, et al. The impact of reducing cardiovascular medication copayments on health spending and resource utilization. *J Am Coll Cardiol*. 2012;60(18):1817-1824. doi: 10.1016/j.jacc.2012.06.050.
 27. Gibson TB, Wang S, Kelly E, et al. A value-based insurance design program at a large company boosted medication adherence for employees with chronic illnesses. *Health Aff (Millwood)*. 2011;30(1):109-117. doi: 10.1377/hlthaff.2010.0510.
 28. Musich S, Wang S, Hawkins K. The impact of a value-based insurance design plus health coaching on medication adherence and medical spending. *Popul Health Manag*. 2015;18(3):151-158. doi: 10.1089/pop.2014.0081.
 29. Motheral BR, Henderson R. The effect of a copay increase on pharmaceutical utilization, expenditures, and treatment continuation. *Am J Manag Care*. 1999;5(11):1383-1394.
 30. Bickman L. A continuum of care. more is not always better. *Am Psychol*. 1996;51(7):689-701.
 31. Zwanziger J, Kravitz RL, Hosek SD, et al. Providing managed care options for a large population: evaluating the CHAMPUS reform initiative. *Civilian Health and Medical Program of the Uniformed Services. Mil Med*. 2000;165(5):403-410.
 32. Murray JP, Greenfield S, Kaplan SH, Yano EM. Ambulatory testing for capitation and fee-for-service patients in the same practice setting: relationship to outcomes. *Med Care*. 1992;30(3):252-261.
 33. Fronstin P, Sepúlveda MJ, Roebuck MC. Consumer-directed health plans reduce the long-term use of outpatient physician visits and prescription drugs. *Health Aff (Millwood)*. 2013;32(6):1126-1134. doi: 10.1377/hlthaff.2012.0493.
 34. About the Institute. American Health Policy Institute website. <http://www.americanhealthpolicy.org/About>. Accessed February 12, 2015.
 35. Chernew ME, Shah MR, Wegh A, et al. Impact of decreasing copayments on medication adherence within a disease management environment. *Health Aff (Millwood)*. 2008;27(1):103-112. doi: 10.1377/hlthaff.27.1.103.
 36. Choudhry NK, Rosenthal MB, Milstein A. Assessing the evidence for value-based insurance design. *Health Aff (Millwood)*. 2010;29(11):1988-1994. doi: 10.1377/hlthaff.2009.0324.
 37. Innovations in employment-based health benefits. Employee Benefit Research Institute website. https://www.ebri.org/pdf/notespdf/ebri_notes_04_apr-11.polfor-rspm.pdf. Published April 2011. Accessed March 10, 2015.
 38. National Business Group on Health. Changing the Delivery Model: Realigning Incentives in Washington DC, March 4-5, 2015. Presented at: Business Health Agenda Conference; March 4-5, 2015; Washington, DC. <https://www.businessgrouphealth.org/conference15/presentations.cfm>. Accessed February 2016.
 39. Rupp MT. Analyzing the costs to deliver medication therapy management services. *J Am Pharm Assoc (2003)*. 2011;51(3):e19-e26; quiz e27. doi:10.1331/JAPhA.2011.10230.
 40. Shrank W. The Center for Medicare and Medicaid Innovation's blueprint for rapid-cycle evaluation of new care and payment models. *Health Aff (Millwood)*. 2013;32(4):807-812. doi: 10.1377/hlthaff.2013.0216.
 41. Guterman S, Davis K, Stremikis K, Drake H. Innovation in Medicare and Medicaid will be central to health reform's success. *Health Aff (Millwood)*. 2010;29(6):1188-1193. doi:10.1377/hlthaff.2010.0442
 42. Lewis A, Khanna V, Montrose S. Workplace wellness produces no savings. *Health Affairs* blog website. <http://healthaffairs.org/blog/2014/11/25/workplace-wellness-produces-no-savings/>. Published November 25, 2014. Accessed April 5, 2015.
 43. Health care survey finds spending on corporate wellness incentives to increase 15 percent in 2014. Fidelity Investments website. <https://www.fidelity.com/about-fidelity/employer-services/health-care-survey-finds-spending>. Accessed March 20, 2015.
 44. Dickersin K. The existence of publication bias and risk factors for its occurrence. *JAMA*. 1990;263(10):1385-1389.