

Increasing Primary Care Physician Productivity: A Case Study

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Objective: To ascertain the impact of advanced access and productivity-based pay on physician productivity and compensation, patient satisfaction, and medical group cost of delivering care.

Study Design: Longitudinal case study.

Methods: Study subjects were 105 primary care physicians (PCPs) continuously employed at a Minnesota medical group that implemented major changes in access to primary care appointments and to PCP compensation arrangements in 2000. We tracked physician productivity, physician compensation, patient satisfaction, and cost to the medical group per relative value unit (RVU) of patient care from 1998 through 2002.

Results: In 1998, 105 PCPs (99.6 full-time equivalents [FTEs]) generated 275 000 work RVUs (WRVUs), and PCP pay averaged \$123 500 per FTE. In 2002, the same 105 PCPs (now 98.1 FTEs) generated 374 000 WRVUs and \$148 000 pay per FTE. From 1998 through 2002, WRVUs per FTE rose 38%, PCP compensation increased 20%, cost of PCP compensation per WRVU produced fell by 13%, overall direct cost of running the clinics per total RVU fell by 20%, and patient satisfaction remained constant. Improvement in operating costs was due to increased physician productivity, lower physician compensation per RVU, and a decline in support staff per 10 000 RVUs from 6.80 to 4.50.

Conclusions: It is possible to substantially and simultaneously improve costs of care, physician compensation, and patient access without harming patient satisfaction. Advanced access and productivity-based pay may be effective ways to address the challenges of timeliness, efficiency, and patient centeredness identified by the Institute of Medicine.

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In its 2001 report, *Crossing the Quality Chasm*, the Institute of Medicine challenged American medicine to transform its approach to care to solve the simultaneous large gaps in various dimensions of quality, including efficiency.¹⁻³ Although most healthcare policy makers have focused on reduction of overuse, underuse, and misuse or on alternative financing mechanisms to lower costs, an approach often emphasized in other industries is to increase productivity.^{2,4,5} The productivity of physicians is commonly measured by relative value units (RVUs) of care produced per full-time equivalent (FTE) physician. Improving this measure without increasing support staff costs or increasing charges could reduce healthcare costs and increase capacity to meet the growing care needs of an aging population.

Although a change in compensation from salary to piece rate has been linked to increases in productivity of 15% to 30% in other industries,^{6,7} only a paucity of published data has evaluated the impact of such changes on physician productivity. Because physician productivity may be affected in intended or unintended ways by the many changes that have reshaped medical care organizations and modified healthcare delivery in recent years, it is important to improve our understanding of trends in physician productivity and the factors that influence it. Medical groups that lower the costs per RVU will have a financial advantage in the marketplace.

We evaluated a natural experiment that occurred in 2000 through 2001 when a large, multispecialty medical group in Minnesota implemented major organizational changes intended to reduce the cost of delivering care. Changes included: (1) a change in physician compensation from straight salary to a fixed amount of pay per work RVU (WRVU). A guaranteed floor of 70% of 1999 compensation was retained in year 2000, but pay became solely dependent on production starting January 1, 2001; (2) a change in scheduling of primary care appointments to facilitate patient access to "same-day care" from their regular primary care physician (PCP) starting in April 2000^{8,9}; and (3) improved access to appointments, which enabled reduced size and scope of registered nurse medical triage systems at each clinic and led to a reduction in registered nurse staffing at most clinics. We have previously described the change process and analyzed the impact of these changes on utilization and quality of care.⁸⁻¹⁴

METHODS

This study was conducted at a Minnesota multispecialty medical group with approximately 120 PCPs who

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provided care to 225 000 adults insured by an affiliated health plan and to 60 000 otherwise insured or uninsured patients at 18 primary care clinics. In 1998, the average FTE PCP at this group was paid based on straight salary and produced an average 2764 WRVUs per year, substantially less than the national average of 3737.¹⁵ Medical group leaders recognized low productivity as a serious threat to the survival of the medical group, so they developed a program of sweeping changes in primary care for their group.

Study subjects were all primary care generalist physicians in family practice, internal medicine, or pediatrics employed at least 0.5 FTE with the medical group on both January 1, 1999, and on December 31, 2002. Approximately 10% of PCPs left the medical group in these years, slightly more than in preceding years; approximately one third of these physicians left due to stated dissatisfaction with changes in the work environment. The study inclusion criteria reduced confounding effects related to the departure of physicians with low RVU production.

The RVU is a nationally used measure of units of work produced by physicians. A short (99212), average (99213), or long (99214) office visit yields 1.03, 1.42, and 2.20 total RVUs (TRVUs), and 0.45, 0.67, and 1.09, respectively, of these TRVUs are designated as WRVUs. Within primary care, TRVU revenue is allocated roughly: 47% to WRVU, 3% to malpractice, and 50% to practice expenses including overhead. Physician pay is based only on the WRVU component of revenue. WRVUs in this study did not include any RVUs assigned to physicians in exchange for the performance of administrative duties or the ordering of laboratory tests

or other ancillary services, but only RVUs generated by the physician in direct patient care. A few physician leaders had FTE subdivided into a portion for their administrative role and a portion for their clinical role.

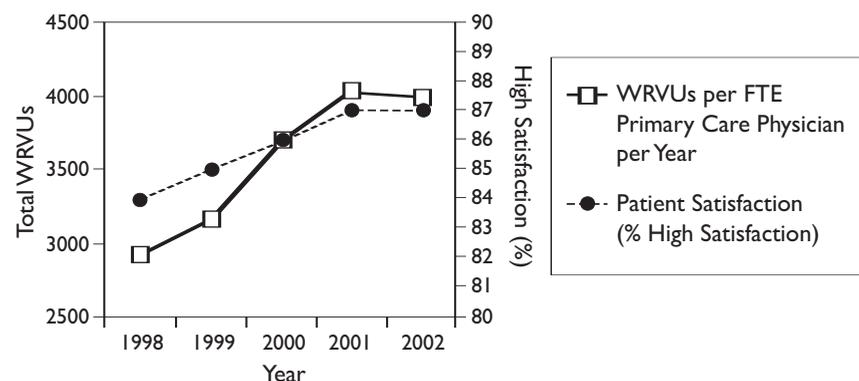
We measured all units of cost and productivity based on FTE PCPs. Physician compensation was expressed as gross pay in dollars, but was not adjusted for inflation and was reported as gross pay (before taxes or withholding) per primary physician FTE. FTE-adjusted gross pay excludes any additional pay for work in urgent care.

Physician production efficiency was defined in this analysis as the number of WRVUs generated in a year by a given physician, divided by the physician's FTE. Mean physician productivity is calculated by summing the WRVUs and the FTEs of a defined group of physicians and dividing total WRVUs by total FTE physicians. The higher this number, the more clinical work the physicians have performed on average over a given period of time. Physician production efficiency is estimated for subsets of physicians by summing the compensation of all physicians in the defined subset by the number of WRVUs produced by the same physicians.

Patient satisfaction was based on routinely conducted quarterly patient surveys of randomly selected new and returning patients seen recently by each PCP. Satisfaction scores were based on 5-point Likert scale responses and scaled so that 100 represented the highest possible satisfaction and 20 represented the lowest possible satisfaction.

This project was reviewed in advance, approved, and monitored by the HealthPartners Institutional Review Board.

Figure 1. Total WRVUs and Patient Satisfaction, 1998 through 2002



The left vertical axis shows WRVUs for 105 continuously employed FTE primary care physicians from 1998 through 2002, and the right vertical axis shows the percentage of patients with high satisfaction scores during the same period. FTE indicates full-time equivalent; WRVU, work relative value unit.

RESULTS

Figure 1 shows that physician production increased from 2930 WRVUs per FTE in 1998 to 3980 WRVUs per FTE in 2002, with the largest increase (15.8%) occurring from 1999 to 2000. Patient satisfaction scores remained stable in the years before and after the organizational changes in 2000, with no statistically significant increase or decline.

Figure 2 shows that physician production efficiency (defined as physician compensation paid per physician WRVU) decreased from \$44.70 under the salary-based

compensation system in place until 2000 to \$38.85 in 2002 under the productivity-based compensation system. During the same period, average compensation rose from \$123 581 per FTE in 1998 to \$148 200 in 2002.

This increase in WRVU was unlikely due to changes in evaluation and management (E/M) coding practices, because these were closely monitored and physicians provided review of random cases every 2 to 3 months to assure accurate coding. The average E/M code level for office visits for family physicians was 3.24 in 2000 and 3.18 in 2002. General internists had average E/M codes of 3.63 in 2000 and 3.44 in 2002. Pediatricians had average E/M codes of 3.14 in 2000 and 3.20 in 2002. The number of clinic days worked increased from approximately 180 days in 1998 to approximately 201 days in 2002 as physicians attempted to generate more income from more WRVUs by seeing more patients in the clinic as patient access increased and shunting of office patients to after-hours urgent care diminished.

Total compensation continued to increase because productivity increased faster than the rate paid per WRVU decreased. Between 2000 and 2002, total costs/TRVU at this medical group decreased from \$65.00 to \$52.08, while staff-to-clinician ratio fell from 4.20 to 3.48 and staff/10 000 TRVUs of care provided fell from 6.80 to 4.50.

DISCUSSION

In this medical group, physician productivity (WRVU per FTE), physician compensation per FTE, and physician production efficiency (physician compensation divided by WRVU produced) increased, while costs and staff for delivering 1 RVU of care both substantially decreased during the 5-year study. These changes had no measurable deleterious effect on patient satisfaction, which continued at high levels during this 5-year period. Physician compensation changes represented a significant cultural change from equal compensation for all, to compensation for production and performance.

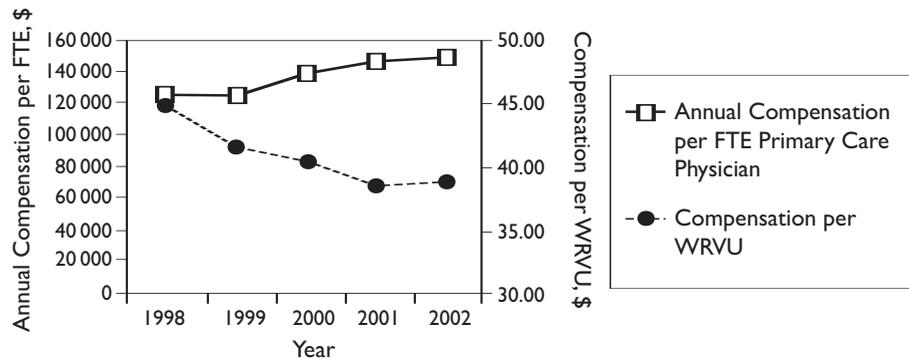
We have previously reported that improved continuity of care related to these changes in appointment scheduling, in conjunction with other factors,

was the driving force behind significant improvements in care quality for patients with diabetes, heart disease, and depression during the study period.^{12,16-18} We have also previously described associated changes in the frequency of primary care, urgent care and emergency department visits, hospital admission rates, and costs of care.¹³

The observed changes in physician work activity in the present study are congruent with previous studies that compared productivity of fee-for-service and salaried workers.^{3,6,7} Similarly, physicians paid fee-for-service are more productive,¹⁹ although selection effects related to employment could account for some of the observed differences in productivity and income in comparisons between the 2 groups of physicians.²⁰ It is rare to have the opportunity to longitudinally measure changes in physician productivity and production efficiency among a group of physicians during a time of rapid change in how physicians are compensated, and even rarer to do so during simultaneous changes in patient access. Medical group leaders realized that pay for production was needed to support improved access to PCP appointments, and the market rapidly was evolving from capitation to discounted fee-for-service.¹⁴ With production-based compensation, physician costs vary as a function of RVUs generated and are no longer fixed. This strategy puts the medical group in a much more competitive position by decreasing the cost of providing services.

The increase in RVUs produced by the physicians in this study could be attributable to at least 4 factors: (1) a one-time increase in services billed from working down the appointment wait time backlog; (2) an ongoing increase in WRVU production per PCP because fewer PCPs were employed after 2000; (3) decreased patient use of urgent care visits and of some subspecialty providers as primary care access improved; and (4)

Figure 2. Compensation per WRVU and per FTE for 105 Primary Care Physicians, 1998 through 2002



WRVU indicates work relative value unit; FTE, full-time equivalent.

an ongoing increase in services billed due to better capture of charges and more accurate coding of services. Physicians worked more days per year and more hours per day after these changes, and physician reactions ranged from high satisfaction to enough dissatisfaction to leave the medical group.^{13,14,16,18,21} It is notable that, despite stresses on physicians and staff and dramatic changes in how care was delivered during this period, patient satisfaction did not deteriorate.

A number of factors limit the interpretation of these data. First, the joint effects of the multiple interventions cannot be separated.^{22,23} Second, the granularity of the data was not sufficient to analyze intervals of time shorter than a year, or to support time series analysis. Third, generalization of our findings to other medical groups should be done with great caution because of contextual differences. Similar interventions in other organizations with different cultures and levels of productivity or access may not yield the same results.²⁴⁻²⁶

Despite these limitations, we believe that the results are interesting and important. First, the data show that a coordinated set of planned changes increased physician production efficiency in a short period of time, without compromising patient satisfaction. Second, compensation changes created concordance between the economic realities facing the medical group and the economic incentives facing individual physicians.^{19,27} Third, the experience we have reported suggests that a coherent set of complementary changes may benefit most parties involved—patients obtained timely access and better continuity of care; physicians worked harder but received increased income; and the medical group reduced costs of delivering care, thereby improving its position in a competitive market. The anticipated benefits to multiple stakeholders helped to create the momentum needed to initiate change and helped sustain changes once made.

CONCLUSIONS

Our results support the hypothesis that when a high priority for change is combined with an effective change process and with the right types of changes, medical groups can transform themselves, and collectively can address many of the challenges posed by the Institute of Medicine.

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