

# The Relationship of Personal Assistance Service Utilization to Other Medicaid Payments Among Working-Age Adults with Disabilities

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Dr. Steven M. Banks passed away unexpectedly in August 2007 during the final stages of preparing this manuscript. We feel his loss deeply.

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**ABSTRACT.** This study examined changes in Medicaid provider payments prior to and following approval for personal assistance services (PAS) among 471 PAS users compared to 295 nonusers who qualified for but did not use PAS, adjusting for differences between users and nonusers using propensity scores. PAS users showed a significantly greater increase in total monthly payments from pre- to post-PAS approval compared to nonusers (35% vs. -9%) due to high average monthly payments for PAS (\$1325). However, users showed a decrease in non-PAS payments compared to nonusers (1%-9% vs. -9%), with significant decreases in payments for both acute/rehabilitation hospitalizations and for nursing home/other long-term residential stays among users. While costly, savings in other areas may help reduce the net cost of PAS.

**KEYWORDS.** Disability, personal care services, community-based services, Medicaid, Medicaid expenditures, nursing facilities, inpatient hospitalization

## ***INTRODUCTION***

National data show that 2%–3% of working-age adults in the United States have difficulty with personal self-care or other activities of daily living (Rehabilitation Research Training Center on Disability Demographics and Statistics, 2007). Many require personal assistance services (PAS) to meet their self-care needs. For some, PAS can mean the difference between living in an institution and participating in the community (Batavia, 2001). PAS involves human assistance enabling people with disabilities to accomplish daily tasks that individuals without disabilities normally do for themselves (LeBlanc, Tonner, & Harrington, 2001; LaPlante, Kaye, Kang, & Harrington, 2004). Tasks may include eating, toileting, and bathing (activities of daily living [ADL]) as well as shopping, cooking, housekeeping, and driving (instrumental activities of daily living [IADL]). Most adults with disabilities rely on unpaid, informal assistance from family members or friends for their personal assistance needs (O'Brien, 2005). However, spending on PAS by state Medicaid programs has grown substantially in the past decade.

Through a variety of mechanisms, Medicaid is the largest payer of PAS for people of all ages (Kitchener, Ng, Harrington, & O'Malley, 2007; LeBlanc et al., 2001). States offering PAS as an optional state plan benefit have flexibility in designing services, but services must be available statewide

to all who meet eligibility standards (Kitchener, Carrillo, & Harrington, 2003; O'Brien, 2005). In 2004, 32 states and the District of Columbia provided PAS as a state plan benefit, serving more than 770,000 individuals. Annual per person Medicaid expenditures for PAS provided through state plans averaged just over \$9,200, but varied widely from \$712 in Utah to \$22,600 in New York (Kitchener et al., 2007). In addition to state plans, states may provide PAS under 1915(c) home and community-based services (HCBS) or 1115 demonstration waivers, or as part of home health services (Crowley, 2003; Kitchener et al., 2003; Kitchener et al., 2007; O'Brien, 2005). Because PAS provided under waivers or as part of home health services may be one of a whole array of services, national data on the number of people specifically receiving PAS or the Medicaid expenditures for PAS under these funding mechanisms are difficult to come by.

Medicaid-funded PAS is increasingly being offered as a consumer-directed (CD) rather than an agency-directed (AD) service. While AD-PAS caregivers are trained and supervised by agency personnel, users of CD-PAS hire, train, supervise, and fire their own PAS caregivers, and a growing number of states are allowing CD-PAS users to develop their own service plans and manage their own budgets (Crowley, 2006; Dale & Brown, 2005; Tritz, 2004). Studies of Medicaid-funded PAS have primarily examined the impact of CD-PAS versus AD-PAS on health outcomes and health service utilization and, to a lesser extent, on Medicaid expenditures. In general, study findings have favored CD-PAS, with users of CD-PAS reporting greater satisfaction with PAS services, greater life satisfaction, better general health, and fewer adverse health events and unmet ADL needs than AD-PAS users (Beatty, Adams, & O'Day, 1998; Beatty, Richmond, Tepper, & DeJong, 1998; Foster, Brown, Phillips, Schore, & Carlson, 2003; Hagglund, Clark, Farmer, & Sherman, 2004; Mattson-Prince, 1997). Studies have also found users of CD-PAS to have increased rates of preventive healthcare utilization, as well as lower rates of doctor visits for medical problems, emergency service use, and hospital and nursing facility days compared to AD-PAS users (Beatty, Adams, & O'Day, 1998; Dale & Brown, 2006).

Whether provided under a consumer- or an agency-directed model, PAS is a potentially costly service, with monthly Medicaid expenditures in 2004 averaging \$770 across all states and ranging as high as \$1,880 (Fox & Kim, 2004; Kitchener et al., 2007). Medicaid policymakers considering expanding PAS to individuals not currently served need to know the total costs associated with the new service, including the cost of PAS

minus any savings that might be realized in other services. While limited, there is some evidence that CD-PAS is associated with reduced expenditures for other services such as nursing facilities, home health services, and inpatient hospitalizations, particularly for nonelderly PAS users, suggesting a partial offset to the high cost of PAS (Dale & Brown, 2005, 2007; Kim, White, & Fox, 2006). For example, Fox and Kim (2004) compared 6 months of expenditures for working-age adults prior to and following enrollment in a CD-PAS program, and found a substantial (25%), but statistically nonsignificant, decrease in inpatient hospital expenditures. However, the lack of an appropriate comparison group limits interpretation of these findings. The goal of the current study was to compare changes in Medicaid expenditures among working-age adults with disabilities prior to and following enrollment in the Massachusetts Medicaid (MassHealth) PAS program (known as the MassHealth Personal Care Assistant program) to a group who qualified for, but did not use, PAS.

### ***The MassHealth Personal Care Assistant Program***

The MassHealth Personal Care Assistant program began in 1976 as a state plan benefit, and is one of the oldest consumer-directed programs in the United States. To be eligible for services, MassHealth members must meet Social Security Administration disability criteria and must require hands-on assistance with 2 or more ADLs, including toileting, bathing, grooming, dressing, eating, taking medications, transferring, walking, using equipment to move, or completing range-of-motion exercises. PAS is prescribed by the clinician overseeing the member's care. Registered nurses and occupational therapists conduct evaluations in members' homes or other settings (e.g., hospitals) and submit authorizations to MassHealth for the number of service hours needed. There is no limit on the number of PAS hours for which members can be approved. In addition, while there is no age restriction for services, more than 70% of the 13,700 MassHealth PAS users in fiscal year (FY) 2005 were working-age adults.

We examined all MassHealth expenditures (i.e., provider payments) prior to and following approval for PAS for two groups of working-age MassHealth members with disabilities with presumably equivalent need for PAS—members who were approved for PAS who used the service, and those who were approved for but never used PAS. We sought to ascertain changes in total MassHealth payments for both groups, from

pre- to post-PAS approval, to determine if PAS use was associated with any savings in non-PAS payments and, if so, to identify the specific categories of payments in which savings occurred. This study received exempt status from the University of Massachusetts Medical School Institutional Review Board.

## METHODS

### *Study Participants*

Participants included working-age (18–64) MassHealth members with disabilities who were approved for PAS and had at least one year of continuous MassHealth enrollment before and after PAS approval between July 1, 1999, and June 30, 2004 (FYs 2000–2004). Because we relied on ICD-9-CM codes accompanying MassHealth claims to classify members by diagnostic categories and to estimate their chronic disease burden (see below), study participants were restricted to MassHealth members without any other source of health insurance. A total of 766 MassHealth members met study criteria. PAS “users” included 471 members who used at least one hour of PAS following approval for services (mean hours of PAS use = 31 hours per week; *SD* = 5; range 4–89). On average, users began to have PAS charges within one week of being approved for PAS, and 96% continuously used PAS for the full year after approval. “Nonusers” included 295 members who were approved for PAS but did not use any PAS in the one year following approval.

### *Data*

Data were retrospectively retrieved from the MassHealth Medicaid Management Information System eligibility and paid claims data files for FYs 2000 to 2004. Claims data were used to identify members’ PAS status (user vs. nonuser), and eligibility data provided demographic characteristics of members, including age, gender, race, and county of residence (grouped into 6 regions of the state). We estimated members’ chronic disease burden using the Chronic Illness and Disability Payment System (CDPS; Kronick, Gilmer, Dreyfus, & Lee, 2000), which is a publicly available, diagnosis-based risk-adjustment tool developed for Medicaid populations. The CDPS generates a score through an algorithm that classifies ICD-9-CM codes from both inpatient and outpatient claims into 19 major diagnostic categories. Individuals with a CDPS

score of 1 are expected to incur average overall Medicaid costs; those with a score of 2 are expected to incur twice the average costs, and so on (Rein, 2005). For indices of disease burden, we used members' annual CDPS scores from the FY prior to PAS approval, as well as the diagnostic categories and the total number of categories into which members were grouped.

MassHealth provider payments for all participating members during the 1 year pre- and 1 year post-PAS approval were obtained from claims data and included all PAS payments for PAS users and all other payments for users and nonusers. Payments for PAS included payments for evaluation and reevaluation, hourly wages for PAS workers, and administrative charges. All other payments included those for acute and rehabilitation inpatient hospitalizations, outpatient and emergency services, physician services, laboratory services, outpatient prescription medications, nursing homes and other long-term residential services, home health services, medical equipment and supplies, and transportation and dental services. All payments were adjusted to 2004 dollars using the Northeast Consumer Price Index for Urban Consumers, and average monthly provider payments for each member were calculated.

### ***Data Analysis***

Because PAS users and nonusers were not equivalent on demographic characteristics and disease burden indices, our first step in the data analysis was to generate propensity scores for all members. Propensity scores are useful in studies where randomization is either impossible or prohibitive, because they control for observed differences in groups. Propensity score methods are commonly used in observational studies of health service outcomes (Berg, Fleegler, van Vonno, & Thomas, 2005; Rotheram-Borus et al., 2003; Rubin, 1997). The propensity score methodology produces a score for each individual that can be used to stratify the two study groups to improve balance on observed covariates (Braitman & Rosenbaum, 2002; Rosenbaum, 1995). We used a logistic regression procedure to produce a propensity score for each member, predicting group membership (PAS user vs. nonuser) from members' demographic characteristics, CDPS score, CDPS diagnostic categories, number of diagnostic categories, and total payments from 4 months prior to PAS approval. Following Rosenbaum (1995), we used the propensity scores to group members into 5 strata, each with 20% of

the sample. Each stratum included members with a similar likelihood of being a PAS user. Strata (as a single, 5-level variable) was used as an independent variable in all analyses. While propensity scores can be shown to effectively control for observed biases between the two study groups, their impact on hidden biases is unknown (Braitman & Rosenbaum, 2002). To further control for the impact of members' chronic disease burden, we also used CDPS scores as a stand-alone independent variable in the model (described below).

We examined all MassHealth payments for both PAS users and non-users in the 1 year pre- and 1 year post-PAS approval. In the period between 12 and 5 months pre-PAS approval, payments were stable and did not differ significantly between the two groups. However, beginning at 4 months and continuing through 1 month prior to approval, a significant increase ( $p = .028$ ) in payments was observed for users and nonusers, averaging \$350 for both groups. Thus, analyses used payments from the 4 months immediately prior to PAS approval. Changes in monthly payments from 4 months pre- through 1 year post-PAS approval were analyzed using Hierarchical Linear Modeling (HLM) with an autoregressive covariance structure. Payments were transformed by taking the square root of the monthly values to reduce the effects of skewed distribution. Independent variables in the model included group (PAS user vs. nonuser), strata, CDPS scores, group by strata interaction, group by strata interaction nested within each individual, time (months 1 through 12), group by time interaction, strata by time interaction, and group by strata by time interaction. The dependent variable was the square root of the average payments per member per month. The goodness-of-fit statistic for the overall HLM model with the square-root transformation of payments was  $R^2 = .73$ .

We used HLM to examine changes in all non-PAS payments, as well as changes within four specific categories of non-PAS payments—acute and rehabilitation hospital stays, nursing home and other long-term residential stays, all ambulatory services, and outpatient prescription medications. Within each of these categories, we deconstructed the average monthly payments into three components: (a) the percentage of members with any payments in the category and among members with payments, (b) the average number of paid claims, and (c) the average payment per claim. The product of these three components equals the average monthly payment within the category and allowed us to identify the specific component contributing to any observed change in payments.

## RESULTS

Table 1 shows demographic characteristics, disease burden indices, and average monthly provider payments for 4 months prior to PAS approval for PAS users and nonusers. Users and nonusers differed significantly on race (users were more likely to be African American) and county of residence,<sup>1</sup> as well as CDPS score, 4 of the CDPS diagnostic categories, and the number of CDPS diagnostic categories. However, the propensity adjusted *p* values shown in Table 1 suggest that the use of propensity scores was generally effective in controlling for observed differences between users and nonusers.

Figure 1 shows the average monthly payments in the 4 months pre- and the 1 year post-PAS approval for users and nonusers (payments for PAS are not included in the postapproval period). Table 2 shows monthly means for total MassHealth payments, PAS payments and non-PAS payments for users and nonusers in the 4 months prior and 1 year following approval for PAS. Mean monthly payments for PAS were \$1,325 (median = \$1,059) in the year following PAS approval, and accordingly, users showed a significantly greater increase (35%) in total payment from pre- to post-PAS approval in comparison to nonusers who showed a decrease (−9%) in total payments ( $p < .001$ ). However, results of the HLM showed that users had a significantly greater decrease from pre- to post- in non-PAS payments compared to nonusers (group by time interaction,  $p = .0110$ ), with monthly payments decreasing by 19% for users compared to 9% for nonusers.

Also shown in Table 2 are the average monthly payments in four non-PAS categories—acute and rehabilitation hospital stays, nursing home and other long-term residential stays, ambulatory services, and outpatient prescription medications—and the breakdown of payments in each category into three components. As these data show, the greater decrease in non-PAS payments among PAS users is largely due to the significantly greater decrease in payments for acute and rehabilitation hospital stays among users in comparison to nonusers (−50% vs. −38%;  $p = .0003$ ). The deconstruction of acute/rehabilitation hospital payments shows that this greater decrease in payments is primarily due to a decrease in the average length of stay in acute/rehabilitation hospitals for users compared to nonusers who showed a slight increase in length of stay (−33% vs. 8%). Overall, PAS users showed an increase in the per day payments for acute/rehabilitation hospital stays from pre- to post-PAS approval

TABLE 1. Demographic characteristics, disease burden, and monthly Medicaid provider payments among MassHealth members approved for PAS: Users and nonusers

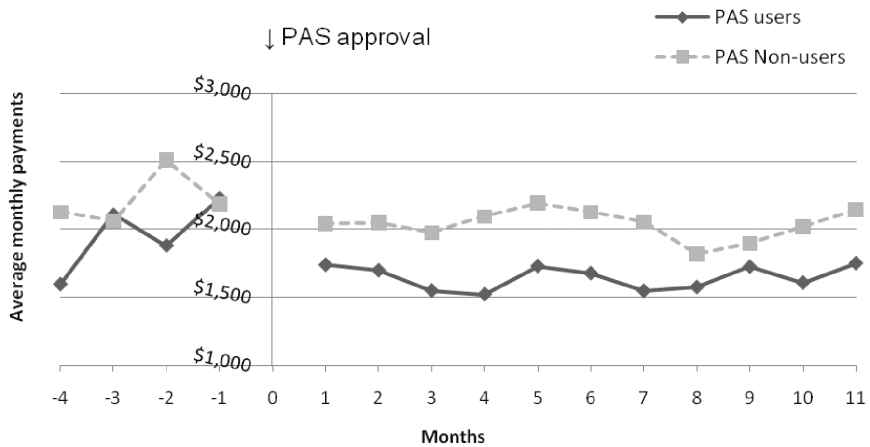
	Approved for PAS		Differences between users and nonusers			
	Users (N = 471) n (%)	Nonusers (N = 295) n (%)	Unadjusted		Propensity adjusted	
			test statistic <sup>c</sup>	p value	test statistic <sup>d</sup>	p value
<i>Demographic Characteristics</i>						
Mean age (SD)	46 (11.9)	45 (12.6)	2.90	.089	0.02	.893
Gender (male)	139 (29.5)	94 (31.9)	0.47	.492	0.01	.922
Race/ethnicity	361 (76.7)	240 (81.4)	2.38	.123	0.10	.756
Caucasian	66 (14.0)	23 (7.8)	6.87	.009	0.79	.374
African American	32 (6.8)	22 (7.5)	0.12	.727	1.21	.273
Hispanic	12 (1.6)	10 (3.4)	0.46	.498	0.67	.412
Other/missing						
<i>County of residence (grouped by region of state)</i>						
Suffolk (Boston area)	49 (10.5)	13 (4.5)	8.85	.003	6.87	.009
Norfolk, Middlesex (Boston suburbs)	25 (5.3)	34 (11.7)	9.97	.002	6.97	.009
Essex (northeast MA)	13 (2.8)	21 (7.2)	8.19	.004	5.43	.020
Bristol, Plymouth, Barnstable, Nantucket, Dukes (southeast MA)	66 (8.9)	49 (16.8)	0.96	.328	0.18	.671
Worcester (central MA)	32 (6.8)	15 (5.2)	0.92	.332	1.85	.174
Franklin, Hampshire, Hampton, Berkshire (western MA)	284 (60.6)	159 (54.6)	3.05	.081	0.01	.919

<i>Disease burden indices</i>						
Mean CDPS score (SD)	2.15 (1.8)	1.86 (1.8)	5.02	.025	0.08	.772
CDPS diagnostic categories <sup>a</sup>						
Cardiovascular	223 (47.4)	116 (39.3)	4.75	.030	0.03	.873
CNS	193 (41.0)	105 (35.6)	2.21	.137	0.01	.943
Diabetes	159 (33.8)	60 (20.3)	16.30	<.001	0.01	.938
Gastrointestinal	127 (27.0)	71 (24.1)	0.79	.374	0.14	.707
Psychiatric	109 (23.1)	75 (25.4)	0.52	.473	0.02	.894
Pulmonary	190 (40.3)	90 (30.5)	7.61	.006	0.00	.953
Skeletal	203 (43.1)	92 (31.2)	11.00	.001	0.00	.973
Number of diagnostic categories						
One	117 (24.8)	105 (35.6)	10.13	.001	0.19	.662
Two or three	141 (29.9)	90 (30.5)	0.03	.867	0.23	.630
Four or more	213 (45.2)	100 (33.9)	9.72	.002	0.01	.912
<i>Monthly Medicaid payments 4 months prior to PAS approval<sup>b</sup></i>						
Mean, in dollars (median; SD)	1,954 (993; 2637)	2,226 (780; 3286)	1.60	.203	0.21	.645

Note. CDPS = Chronic Illness and Disability Payment System.

<sup>a</sup>Members may be in more than one category; conditions with small Ns (< 82) are not reported. <sup>b</sup>Excludes payments for PAS. <sup>c</sup>Test statistics are based on a GLM model. <sup>d</sup>Test statistics are from the group effect on a GLM model.

FIGURE 1. Average monthly non-PAS Medicaid payments among PAS users and nonusers pre- and post-PAS approval.



Note. Payments for PAS are not included in the post-PAS approval period. Payments shown are in raw dollars.

(34%) compared to nonusers, who showed a slight decrease in per day payments (−6%).

In addition to a greater decrease in payments for acute/rehabilitation hospital stays, users showed a significantly greater decrease in payment for nursing home and other long-term residential stays from pre- to post-PAS approval compared to nonusers (−31% vs. 25%;  $p = .033$ ). This decrease is largely due to a decrease in the percentage of users with any nursing home or other residential stays (from 3% to 2%) compared to nonusers, who showed an increase in nursing home or other residential stays (from 10% to 11%). Of note, among all members with a nursing home stay in the 4 months prior to approval ( $n = 44$ ; 26 nonusers, 18 users), nonusers were 9 times more likely than users to have a nursing home stay in the post-PAS approval period (88% vs. 44%, respectively; OR = 9.58, 95% CI = 2.09 – 43.84). Among those without a nursing home stay in the 4 months prior to approval ( $n = 722$ ; 269 nonusers, 453 users), nonusers were almost 3 times as likely to have a nursing home stay in the postperiod compared to users (7.4% vs. 2.9%, respectively; OR = 2.71, 95% CI = 1.33 – 5.56).

There was no significant difference between PAS users and nonusers in changes in payments for ambulatory services from pre- to post-PAS

TABLE 2. Differences in all monthly Medicaid payments pre- and post-PAS approval for users and nonusers

	Users (N = 471)			Non users (N = 295)			p value <sup>a</sup>
	Pre	Post	% change	Pre	Post	% change	
Mean monthly Medicaid payments (total)	\$1,954	\$2,971	35%	\$2,226	\$2,039	-9%	<0.001
PAS payments	\$0	\$1,325	N/A	\$0	\$0	N/A	N/A
Non-PAS payments <sup>b</sup>	\$1,954	\$1,646	-19%	\$2,226	\$2,039	-9%	0.011
<i>Categories of non-PAS payments</i>							
Acute inpatient and rehabilitation hospital stays (monthly)	\$530	\$266	-50%	\$644	\$402	-38%	0.0003
Percentage of members with any acute/rehab hospital stays	7%	4%	-43%	7%	4%	-43%	
Average length of stay per using member (days)	12	8	-33%	13	14	8%	
Average payment per day	\$625	\$838	34%	\$693	\$654	-6%	
Nursing homes and other long-term residential stays (monthly)	\$108	\$75	-31%	\$357	\$446	25%	0.033
Percentage of members with any nursing home/institutional stays	3%	2%	-33%	10%	11%	10%	
Average length of stay per using member (days)	26	28	8%	28	29	4%	
Average payment per day	\$140	\$153	9%	\$134	\$142	6%	
Ambulatory services (monthly)	\$925	\$873	-5%	\$923	\$895	-3%	0.8966
Percentage of members with any ambulatory claims	81%	82%	1%	76%	71%	-7%	
Average number of ambulatory claims per using member	16.6	14.4	-10%	17.5	18.2	4%	
Average payment per claim	\$70	\$74	4%	\$70	\$71	1%	
Outpatient prescription medications (monthly)	\$391	\$431	10%	\$302	\$296	-2%	<.0001
Percentage of members with any prescription claims	80%	80%	< 1%	67%	63%	-6%	
Average number of prescription claims per using member	7.7	7.7	< 1%	7.3	7.2	-1%	
Average payment per claim	\$63	\$70	10%	\$61	\$65	7%	

Note. The preperiod includes payments in the 4 months prior to PAS approval; the postperiod includes the average payments in the 1 year following PAS approval. All payments shown in table are in raw dollars. Ambulatory services include outpatient, emergency, and physician services; laboratory services; home health services; medical equipment and supplies; and transportation and dental services.

<sup>a</sup>p values are from the HLM procedure testing the difference in average monthly payments in the 4 month pre-PAS approval compared to cumulative payments in the 1 year post-PAS approval. Square-root transformations of payments were used in the HLM procedures. <sup>b</sup>Model R<sup>2</sup> = .73

approval. However, PAS users did show a significant increase ( $p < .0001$ ) in payments for outpatient prescription medications in comparison to nonusers. This increase is due both to a greater increase in the average payment per prescription claim among users in comparison to nonusers and a larger decrease in the number of nonusers with prescription claims in comparison to users ( $-6\%$  vs.  $< 1\%$ ).

## DISCUSSION

Consistent with other studies (Fox & Kim, 2004), total MassHealth payments for PAS users increased in the one year post-PAS approval compared to nonusers, with the increase due to the high payments for PAS itself, which averaged \$1,325 per month for users. However, our findings suggest that the net cost of PAS may be somewhat reduced because of savings in other, non-PAS payments.

### *Changes in Non-PAS Payments*

Advocates contend that PAS is a service that widens opportunities for people with disabilities to live and work in their communities by providing an alternative to facilities, such as hospitals, nursing homes, or other long-term residential settings (Batavia, 2001), but this notion has received only limited empirical inquiry. In this study, we examined changes in Medicaid payments following approval for PAS among PAS users and nonusers in four different (non-PAS) categories and found significant decreases in payments for users compared to nonusers in two categories reflecting different types of facilities—acute/rehabilitation hospitals and nursing homes or other long-term residential settings. Taken together, we found PAS users to have an approximately \$300 per month decrease in Medicaid payments for stays in facilities compared to a \$150 per month decrease among nonusers. However, when we deconstructed these payments, we observed that the component contributing to the decrease differed across the two types of facilities.

For acute/rehabilitation hospitals, PAS users showed a reduction in average lengths of stay from pre to post from 12 to 8 days, while lengths of stay for nonusers increased slightly from 13 to 14 days. Thus, PAS may act to facilitate discharge from an acute or rehabilitation hospital because it provides the PAS users with adequate care giving at home. Notably, we observed an increase of 34% in the per-day payments for acute/rehabilitation hospitalizations for PAS users from pre- to post-PAS approval.

While it seems unlikely that PAS will prevent all acute hospitalizations, some studies suggest that PAS use is associated with fewer preventable hospitalizations and other adverse health outcomes (Beatty, Adams, & O'Day, 1998; LaPlante et al., 2004; Mattson-Prince, 1997). It may be that, when they are necessary, acute hospitalizations for PAS users are shorter and more appropriate but somewhat more costly.

Conversely, the differences in payments for nursing home or long-term residential stays from pre- to post-PAS approval for users compared to nonusers were driven largely by a decrease in the percentage of PAS users with stays in these facilities compared to an increase in the percentage among nonusers. As might be expected among working-age Medicaid enrollees, the number of members with any nursing home stays was relatively small. However, our examination of the pattern of nursing home stays in the pre and post periods for both users and nonusers suggests that PAS may both facilitate discharge from and divert admission to nursing homes for users, and that the lack of PAS may place some individuals at risk for nursing home placement. On the whole, our findings provide some evidence for the claims that PAS may be used as an alternative to more restrictive settings (Batavia, 2001).

The analysis of payments for outpatient prescription medications showed a significant increase in payments from pre- to post-PAS approval for PAS users compared to nonusers, and our subsequent analysis showed that this rise could be attributed to two components of the payments. First, PAS users had generally higher prescription payments compared to nonusers, even in the pre-PAS approval period, and showed a slightly greater increase in the amount paid per prescription from pre- to post-PAS approval than nonusers (10% vs. 7% increase). This is not surprising given that PAS users generally had a greater prevalence of chronic health conditions (e.g., diabetes) that may require more costly prescription drugs compared to nonusers (Agency for Healthcare Research and Quality, 2005). In addition, the greater decrease in the percentage of nonusers with outpatient prescription payments compared to users contributed to the difference we observed in prescription payments for PAS users. We cannot directly account for this decrease in the percentage of nonusers with prescription payments. However, we were able to ascertain that there were members without any prescription payments over the one year post period among both users ( $n = 30$ ) and nonusers ( $n = 52$ ). In all cases, the lack of outpatient prescription payments was not due to stays in either acute/rehabilitation hospitals or nursing homes or other long-term residential settings.

Across the four non-PAS categories, payments for PAS users decreased approximately \$310 per month from pre- to post-PAS approval, compared to \$190 per month for nonusers, resulting in a \$120 difference in the reduction of non-PAS payments for users versus nonusers. While payments for PAS averaged \$1,325 per month among users in the one year following PAS approval, savings in other, non-PAS payments suggests a modest reduction in the cost of PAS, to about \$1,200 per month, may be realized.

### ***Rise in Payments Prior to PAS Approval***

As noted, we observed that in the 12 to 5 months prior to PAS approval, payments for both groups were stable and did not differ significantly. However, this analysis brought to light that, prior to being evaluated for PAS, both groups incurred a rise in Medicaid payments in the preceding 4 months. We speculate that this collective rise in health care payments shortly preceding a request for a PAS evaluation could be attributed to events that were associated with a loss of ADL or IADL independence and triggered the application for PAS, such as accidents and injuries, sudden medical problems, or worsening of a disabling condition.

### ***Implications for Policy***

For state policymakers considering implementing or widening PAS, this study suggests that PAS may be associated with a modest reduction in other Medicaid payments for acute/rehabilitation hospitals and/or nursing homes or other long-term residential settings. While PAS, like many community-based services, springs from a values-based orientation—for example, PAS has been shown to improve quality of life among people with disabilities (Beatty, Adams, & O'Day, 1998; Foster et al., 2003; Hagglund et al., 2004)—our study suggests that a small reduction in other Medicaid payments may be anticipated. While we only examined payments in the first year following PAS approval, other studies have found PAS effects on nursing facility expenditures to continue beyond one year (Dale & Brown, 2006).

Other matters raised by our analysis are relevant to policy development and inquiry. In particular, we are unable to confidently explain why some MassHealth members requested and were approved for PAS but did not use the service. Differences between the two groups in demographic characteristics, particularly area of residence, and disease burden may be

relevant. For example, securing a qualified personal assistant takes considerable effort (Glazier, 2000); the area of the state in which one lives may make it difficult to find qualified caregivers. In Massachusetts, as in other states, there are labor shortages for PAS caregivers (Kaye, Chapman, Newcomer, & Harrington, 2006; Kim et al., 2006). Other factors not captured in our data may distinguish the two groups. These might include a greater availability of informal ADL supports among nonusers compared to users, differences in the willingness of individuals to use PAS, or differences in discharge practices of acute and long-term care settings within geographic areas. These matters call for additional investigation and policy development.

### ***Study Limitations and Strengths***

Because they control for observed but not unobserved factors, the propensity scores may not have fully controlled for differences between the two groups. There may continue to have been unobserved differences between the groups, such as differences in functional or ADL or IADL status, that could account for the differences we saw in post-PAS approval payments. Unfortunately, specific measures of functional status are not available in the MassHealth eligibility and claims databases. This study only examined changes in Medicaid payments; PAS users and nonusers who were also enrolled in Medicare or had other third-party insurance were not included in the analysis. Thus, services rendered through other payment mechanisms were not assessed, and therefore these findings cannot be generalized to other insurance beneficiary groups. Likewise, there may be other effects on provider payments that are not captured, such as discharge planning practices or local availability of services. In addition, this study included only working-age adults, which limits the generalizability of the findings to the other populations of PAS users.

Further, due to the nonexperimental, cross-sectional nature of the study, although a relationship between PAS use and other Medicaid payments was found, a direct causal claim cannot be made. However, this study was strengthened by our use of a comparison group of individuals who were approved for but did not use PAS, because they presumably had a similar need for these services as users. Particularly because we observed costs to rise for both groups immediately prior to approval for PAS, any observed decrease after PAS could be attributed to regression to the mean. The comparison group, as well as our

use of propensity scores to control for observed group differences, does allow us to have increased confidence that the greater reduction in payments for users compared to nonusers can be attributed to the impact of PAS.

### ***Future Research***

Authors have suggested that PAS may promote employment among working-age adults with disabilities (Barcus & Targett, 2003; Stoddard, 2006). While we did not explore this outcome, the findings do suggest that PAS supports community living. Future studies could explore directly the relationship of PAS to employment. There may be an even greater return on investment in PAS if the service is found to allow previously unemployed adults with disabilities to work. This study also did not examine whether PAS users received an optimal amount of PAS. Many PAS users do not use all of the hours they are approved for, which may be due, in part, to the difficulty in finding appropriate caregivers. Future research could explore the optimal amount of PAS and whether optimal amounts will have different effects on Medicaid payments.

## **CONCLUSIONS**

Advocates and policymakers interested in promoting and expanding access to PAS among Medicaid beneficiaries have evidence that PAS use is associated with savings in other areas, particularly in payments for acute/rehabilitation hospitalizations, as well as for nursing home or other long-term residential settings. While the cost of PAS can be high, the potential savings in other areas can help to reduce the net cost of PAS itself. Moreover, these findings provide some evidence for the notion that PAS is a service that supports community living for adults with disabilities (Webb, 2003).

## **NOTE**

1. The disproportionate representation of PAS users in the western part of the state is likely attributed to an independent living center in that area that is very active in recruiting individuals into the MassHealth Personal Care Attendant (PCA) program.

## REFERENCES

- Agency for Healthcare Research and Quality. (2005). *The top five therapeutic classes of outpatient prescription drugs ranked by total expense for adults age 18 and older in the US civilian noninstitutionalized population. Medical Expenditure Panel Survey: Statistical Brief #198*. Rockville, MD: Agency for Healthcare Research and Quality.
- Barcus, M. J., & Targett, P. (2003). Maximizing employee effectiveness through use of Personal Assistance Services at the workplace. *Journal of Vocational Rehabilitation, 18*(2), 99–106.
- Batavia, A. I. (2001). A right to personal assistance services: “Most integrated setting appropriate” requirements and the independent living model of long-term care. *American Journal of Law and Medicine, 27*(1), 17–43.
- Beatty, P. W., Adams, M., & O’Day, B. (1998). Virginia’s consumer-directed personal assistance services program: A history and evaluation. *American Rehabilitation, 24*(2/3), 31.
- Beatty, P. W., Richmond, G. W., Tepper, S., & DeJong, G. (1998). Personal assistance for people with physical disabilities: Consumer-direction and satisfaction with services. *Archives of Physical Medicine & Rehabilitation, 79*(6), 674–677.
- Berg, G. D., Fleegler, E., van Vonno, C. J., & Thomas, E. (2005). A matched-cohort study of health services utilization outcomes for a heart failure disease management program. *Disease Management, 8*(1), 35–41.
- Braitman, L. E., & Rosenbaum P. R. (2002). Rare outcomes, common treatments: Analytic strategies using propensity scores. *Annals of Internal Medicine, 137*(8), 693–696.
- Crowley, J. S. (2003). *An overview of the Independence Plus Initiative to promote consumer-direction of services in Medicaid*. Washington DC: Henry J. Kaiser Family Foundation.
- Crowley, J. S. (2006). *Medicaid long-term services reforms under the Deficit Reduction Act*. Washington DC: Henry J. Kaiser Family Foundation.
- Dale, S., & Brown R. (2005). *The effect of cash and counseling on Medicaid and Medicare costs: Findings for adults in three states. Final report*. Princeton, N.J.: Mathematica Policy Research.
- Dale, S., & Brown, R. (2006). Reducing nursing home use through consumer-directed personal care services. *Medical Care, 44*(8), 760–767.
- Dale, S. B., & Brown, R. S. (2007). How does cash and counseling affect costs? *Health Services Research, 42*(1), 488–509.
- Foster, L., Brown, R., Phillips, B., Schore, J., & Carlson, B. L. (2003). Improving the quality of Medicaid personal assistance through consumer direction. *Health Affairs, Web Exclusive, W3*, 162–175. Accessed January 5, 2008 from [content.healthaffairs.org/cgi/reprint/hlthaff.w3.162v1.pdf](http://content.healthaffairs.org/cgi/reprint/hlthaff.w3.162v1.pdf)
- Fox, M. H., & Kim, K. M. (2004). Evaluating a Medicaid home and community-based physical disability waiver. *Family & Community Health, 27*(1), 37–51.
- Glazier, R. (2000, July). PCAs I have known. *New Mobility, 11*(82), 46–48.
- Hagglund, K., Clark, M., Farmer, J., & Sherman, A. (2004). A comparison of consumer-directed and agency-directed assistance services programmes. *Disability and Rehabilitation, 26*(9), 518–527.

- Kaye, H. S., Chapman, S., Newcomer, R. J., & Harrington, C. (2006). The personal assistance workforce: Trends in supply and demand. *Health Affairs*, 25(4), 1113–1120.
- Kim, K. M., White, G., & Fox, M. (2006). Comparing outcomes of persons choosing consumer-directed or agency-directed personal assistance services. *Journal of Rehabilitation*, 72(2), 32–43.
- Kitchener, M., Carrillo, H., & Harrington, C. (2003). Medicaid community-based programs: A longitudinal analysis of state variation in expenditures and utilization. *Inquiry*, 40(4), 375–389.
- Kitchener, M., Ng, T., Harrington, C., & O'Malley, M. (2007). *Medicaid home and community-based service programs: Data update*. Washington DC: Henry J. Kaiser Family Foundation.
- Kronick, R., Gilmer, T., Dreyfus, T., & Lee, L. (2000). Improving health-based payment for Medicaid beneficiaries: CDPS. *Health Care Financing Review*, 21(3), 29–64.
- LeBlanc, A., Tonner, C., & Harrington, C. (2001). State Medicaid programs offering personal care services. *Health Care Financing Review*, 22(4), 155–173.
- LaPlante, M. P., Kaye, H. S., Kang, T., & Harrington, C. (2004). Unmet need for personal assistance services: Estimating the shortfall in hours of help and adverse consequences. *Journals of Gerontology, Series B, Psychological Sciences & Social Sciences*, 59(2), S98–S108.
- Mattson-Prince, J. (1997). A rational approach to long-term care: Comparing the independent living model with agency-based care for persons with high spinal cord injuries. *Spinal Cord*, 35(5), 326–331.
- O'Brien, E. (2005). *Long-term care: Understanding Medicaid's role for the elderly and disabled*. Washington DC: Henry J. Kaiser Family Foundation.
- Rehabilitation Research Training Center on Disability Demographics and Statistics. (2007). In *2006 Disability Status Reports*. Ithaca, NY: Cornell University.
- Rein, D. (2005). A matter of classes: Stratifying health care populations to produce better estimates of inpatient costs. *Health Services Research*, 40(4), 1217–1233.
- Rosenbaum, P. R. (1995). *Observational studies*. Springer Series in Statistics. London: Springer-Verlag.
- Rotheram-Borus, M. J., Song, J., Gwadz, M., Lee, M., Van Rossem, R., & Koopman, C. (2003). Reduction in HIV risk among runaway youth. *Prevention Science*, 4, 173–187.
- Rubin, D. B. (1997). Estimating causal effects from large data sets using propensity scores. *Annals of Internal Medicine*, 127(8S), 757–763.
- Stoddard, S. (2006). Personal assistance services as a workplace accommodation. *Work: A Journal of Prevention, Assessment & Rehabilitation*, 27(4), 363–369.
- Tritz, K. (2004). *Long-term care: Consumer-directed services under Medicaid*. CRS Report for Congress, Order Code RL32219. Washington DC: Congressional Research Service, The Library of Congress.
- Webb, S. (2003). Independent living and employment services: Equal paths to community integration. *Journal of Vocational Rehabilitation*, 18(2), 125–130.