

# Disenrollment From an Acute/Long-Term Managed Care Program (PACE)

Helena Temkin-Greener, PhD,\* Alina Bajorska, MS,\* and Dana B. Mukamel, PhD†

**Background:** The Program of All-Inclusive Care for the Elderly (PACE) is an acute/long-term managed care plan designed to care for the most frail and vulnerable Medicare beneficiaries. To our knowledge, this is a first study to examine patterns and predictors of disenrollment from PACE.

**Objective:** PACE, with its comprehensive delivery system, dual capitation, and a focus on the most vulnerable population, may be expected to achieve low rates of exit and little selective disenrollment. This study examines whether these goals have been accomplished.

**Research Design:** The study includes 30 PACE programs and 14,657 individuals enrolled in them. Individual-level records, obtained from an administrative database, contain information on sociodemographics, caregiver support, health status and disability, medical history, service utilization, and disenrollment. Program-level variables also were included. Cox proportional hazard models, with time-varying and time-invariant covariates, were employed to predict time to disenrollment.

**Results:** Our findings show a low level of disenrollment. We find no increase in disenrollment risk by age, functional or cognitive impairment, Medicaid eligibility, or diagnoses. Certain characteristics (eg, nursing treatments) appear to reduce the disenrollment hazard, whereas others (eg, hospital admissions, private pay status) significantly increase it. The risk of disenrollment also increases with longer nursing home stays, until 80–90 days, whereupon it begins to decline.

**Conclusions:** Both enrollee and program-level attributes predict program disenrollment. Programmatic and quality of care improvements may be needed to further minimize disenrollment, particularly in programs experiencing rates that are substantially greater than the average.

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From the \*Department of Community and Preventive Medicine, University of Rochester School of Medicine, Rochester, New York; and †Department of Medicine, Center for Health Policy Research, University of California Irvine.

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Reprints: Helena Temkin-Greener, PhD, Research Associate Professor Department of Community and Preventive Medicine, University of Rochester School of Medicine, Box 644, 601 Elmwood Avenue, Rochester NY 14642. E-mail: Helena\_Greener@urmc.rochester.edu.

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In the early 1990s, the Health Care Financing Organization (now Centers for Medicare and Medicaid Services), started the Program of All-Inclusive Care for the Elderly (PACE). PACE started as a demonstration program and obtained permanent Medicare provider status after the enactment of the Balanced Budget Act of 1997. PACE health plans are considered to be Medicare health maintenance organizations (HMOs). They are, however, unlike the traditional Medicare HMOs in terms of the population served, the scope of covered services, and the delivery model. PACE focuses specifically on the vulnerable, frail elderly population. The participants (as the enrollees are called) must be nursing home certified (by their State Medicaid agency) but living in the community at the time of enrollment to be eligible.<sup>1</sup> In addition to all primary and acute care services, PACE provides comprehensive chronic care benefits (eg, personal care, homemaker, adult day care, in-home care), service coordination, and care management, as well as unlimited institutional long-term care. The goals of the program are to improve the care, satisfaction, and to prevent/delay institutional placement of this vulnerable enrollee population, thus producing savings for the public payers, Medicare, and Medicaid. PACE programs are capitated by both Medicaid and Medicare and predominantly have attracted those beneficiaries who are dually entitled to these public benefits.<sup>2</sup> Each program negotiates their Medicaid rates with their respective state agencies, and all programs receive risk adjusted Medicare payments to account for the expected higher costs of their enrollee case-mix. Given these programmatic innovations, PACE may be expected to be more effective than the traditional Medicare HMOs in overcoming the propensity of the sicker participants to disenroll.

In managed care, disenrollment rates are an important indicator of dissatisfaction. Medicare HMO enrollees are free to leave their health plans on a monthly basis, switching either to the fee-for-service or to another managed care plan. Studies have shown that disenrollment rates tend to be higher in plans in which enrollees are less satisfied with various aspects of the care they receive, for example, with access to specific services or with the quality of care.<sup>3,4</sup> Disenrollment rates also are of interest because of concerns that managed care plans experience favorable selection, with healthier beneficiaries remaining and the sicker ones leaving.<sup>5–7</sup> The evidence for such favorable selection is, however, not unequivocal.

A number of studies have reported no increase in disenrollment among patients with such chronic conditions as

cancer, diabetes, or costly mental illness.<sup>8-10</sup> Others show that disenrollees to the fee-for-service are in poorer health than the continuing enrollees or those who re-enroll in another HMO.<sup>6,7,11-14</sup> Higher disenrollment rates have been documented in populations of Medicare beneficiaries who are also eligible for Medicaid, are African-American, disabled, or very old.<sup>15,16</sup> The tendency of these vulnerable beneficiaries to disenroll has been particularly troubling to health policy makers, posing a question whether these disenrollments reflect subtle pressures from the HMOs trying to minimize the provision of costly services, enrollee dissatisfaction with a particular type of plan, or their dislike of basic managed care features.

PACE programs, with their comprehensive delivery system, dual capitation, and a focus on the most vulnerable population, may be expected to have low rates of exit and little, if any, selective disenrollment. In promulgating the PACE regulations, federal policy makers clearly wished to promote this expectation. A subsection of PACE regulations devoted to participant enrollment and disenrollment was put in place to "prevent PACE organizations from selecting enrollees who need less care and whose care is therefore less costly," and to "protect participants who are exhibiting difficult behaviors from being 'dumped' by the PACE organizations."<sup>17</sup>

To date, there have been no formal studies of disenrollment patterns in PACE despite the fact that PACE serves a very vulnerable population (frail and impaired, dually entitled, high proportion of minorities), has already moved from a demonstration to permanent Medicare provider status, currently operates 40 programs serving more than 12,000 people in 21 states, and is poised for further expansion.<sup>2</sup> In this study, we examine patterns of disenrollment in PACE across programs and time and identify enrollee and program predictors of disenrollment.

## METHODS

### Sample

This study is based on data for 14,657 PACE participants enrolled in 30 of the 34 programs in existence before January 2002. Four programs were excluded because of incomplete or inconsistent data. We examined the characteristics of these programs (eg, location, program age, health system affiliation, percent of disenrollees, etc.) and determined that their exclusion would not impact our findings.

The original analytical file included data for 15,154 enrollees for the period 1989 through 2002 (the actual time period for each site depends on when the program was established). We excluded 497 (3.3%) records because missing values of predictor variables.

The final analytical file contains both variables that are time-invariant, ie, static in value over time, and time varying, with values that may change over time. The file was created in counting process input style with person-period records.<sup>18</sup> In such a file, each individual has multiple records, one for each period during which values of predictors stay constant. Change in any time varying predictor generates a new record. The final analytical file includes 239,678 person periods.

### Data and Variable Definitions

Data were obtained from several sources. Information about each enrollee was obtained from an administrative database (dataPACE) containing individual-level records on the participants' sociodemographics, informal caregiver support, health status and disability, medical history, service utilization, and disenrollment. Information is recorded at specific intervals, generally several times per year. At each program, staff members are trained in data collection and are provided with common protocols, data element definitions, and a list of required and optional variables. Assessment of dataPACE quality have been reported elsewhere.<sup>19,20</sup>

Program-specific measures came from several sources, including interviews and surveys we conducted,<sup>2,21</sup> reports from the National PACE Association; and data from the Area Resource Files and the US Census.

### Individual-Level Measures

After the classification of variables first employed by Andersen and Newman<sup>22</sup> and subsequently adapted and used in several studies of disenrollment,<sup>5,23,24</sup> we view continued plan enrollment as a function of participant-specific predisposing, enabling, health status, and utilization factors. The predisposing factors we considered for inclusion in this study were age, gender, education, race/ethnicity, residence, and the availability of informal support defined as presence of household and/or nonhousehold caregivers. We included 4 enabling factors. Medicaid eligibility is defined as categorical, when accompanied by Supplemental Social Security Income (SSI), or as health-related (no SSI). Enrollees who are not Medicaid eligible are identified as private pay. Other enabling factors include age of the program and its capitation status (Medicaid only or Medicare and Medicaid). Age of the program is included because early statistics from PACE showed lower rates of disenrollment in mature programs compared with the newly formed PACE organizations.<sup>25</sup> Because PACE programs go through a development phase during which they may be capitated for Medicaid while providing Medicare services on a fee-for-service basis and because this may create different incentives for dealing with high users of some services (eg, hospital care), we decided to include capitation status as an enabling factor. Social support and capitation status are included as time-varying covariates. All other predisposing and enabling variables are time-invariant. Age of the participant and age of the program are entered as of enrollment and thus are assumed to be constant over time in the study.

Because the decision to disenroll is more likely to be influenced by health status closest to disenrollment rather than on status at baseline, several time-varying measures were considered. These were self-reported health status; bowel and bladder incontinence; behaviors such as wandering, verbal disruption, physical aggression, and regressive behavior; selected medical diagnoses; cognitive impairment; and functional status. Cognitive impairment was based on the diagnosis of dementia and a score on the Short Portable Mental Status Questionnaire (SPMSQ).<sup>26</sup> Functional status was measured by the ability to perform 7 activities of daily living (ADLs). Using the ADL scaling proposed by Morris,<sup>27</sup>

we classified the ADLs as early, middle, or late loss categories, each reflecting a progressively greater loss of functioning. DataPACE defines each ADL as independent, needing some help or supervision, or dependent. We used this classification to assign numeric scores ranging from 0 to 2 for each ADL. Grooming, dressing, and bathing were then assigned to early ADL loss; toileting, transferring, and walking to middle ADL loss; and feeding to late ADL loss. The 3 categories are each expressed as the sum of 0–2 scores for the ADLs they encompass.

Three time-varying measures of service utilization were also included: nursing treatments, hospital admissions, and nursing home days. Hospital admissions (categorical variable) and nursing home days (continuous variable) were counted during a 6-month period before disenrollment (for the disenrollees) and over a comparable period of time for the continuing enrollees. Nursing treatments were categorized as either acute (eg, injections, inhalations) or chronic (eg, daily oxygen, ostomy care) and defined as dichotomous, time-varying variables at each assessment. Finally, we also included the calendar year of enrollment as a predictor to control for secular trends.

### Program-Level Measures

Several program-specific variables that could influence disenrollment also were included. Each program was categorized based on its sponsorship, ie, whether the program was independent or part of an institutional or a community health system. Programs that are independent may have greater flexibility in how services are delivered, thus having more satisfied enrollees and lower disenrollment rates. We included staffing ratios because these may reflect the quality of care provided to the enrollees. Staffing ratios were calculated as full-time equivalents per 100 participants, separately for day center aides, home care workers, and the professional staff (ie, nurses, physicians, therapists). A team effectiveness score, another quality of care measure, was constructed from team members' responses to 7 items comprising the domain of perceived team performance with regard to technical quality of patient care and the ability to meet patient care needs. This measure of team performance was originally developed by Shortell et al<sup>28</sup> and was subsequently adapted for use in PACE.<sup>21</sup> The PACE team survey was administered to all 1860 direct care staff members and resulted in a 65% response rate ( $n = 1209$ ). The responses were measured on a 5-point Likert scale, which has been shown to have good psychometric properties.<sup>21</sup> We measured the availability of PACE alternative services by the number of nursing home beds per 1000 people in each program's market area (county). A status indicator was also created to identify each program as either a "demonstration" or a "replication." We created this indicator for the original demonstration programs ( $n = 10$ ) and for their later replications ( $n = 20$ ) because our preliminary assessment of the data suggested that the former had continuously lower rates of disenrollment compared with the latter.

### Statistical Analyses

We estimated Cox proportional hazard model, with time-varying and time-invariant covariates, to analyze time from enrollment to disenrollment from PACE. Observations were censored at death and at the end of the study period.

In the first phase of model development, we used stratified models with strata corresponding to PACE sites. Starting with a broad set of potential predictors (Table 1), we removed nonsignificant variables in small groups, performing likelihood ratio tests for each group. The  $P$  value for the whole set of removed variables was 0.45. Working with the reduced model, we explored various functional forms for nondichotomous predictors to obtain the best fit. For nursing home days, we used fractional polynomial method, supported by graphical representations, to find the best fitting curve.<sup>29</sup> The second-degree fractional polynomial provided a significantly better fit than the first-degree polynomial. We then re-entered into the reduced model variables previously removed to check again their significance and confounding effects.

In the second phase of model development, to investigate the effect of site characteristics on disenrollment, we fitted proportional hazard model with shared frailty. Frailty in these types of models accounts for correlations between observations for participants enrolled in the same site.<sup>29,30</sup> The final model is a Cox proportional hazard model with time-varying predictors and shared frailty for sites. This model includes variables that were significant at the 0.1-level.

To verify the proportional hazard assumption, we used the test proposed by Grambsch and Therneau and implemented in STATA 8.2.<sup>30</sup> It tests nonzero slopes in generalized linear regressions of the scaled Schoenfeld residuals on log of time, for individual covariates and overall. The assumption was rejected for the indicator of a demonstration versus a replication site. We further investigated how the effect of this variable changes over time by estimating Cox model with the site indicator interacted with time. This is illustrated in Figure 1. For parsimony, in the final model, we assumed that the effect of site group indicator is constant over time.

## RESULTS

Table 1 shows the characteristics of the sample population for all potential individual and program-level predictor variables considered in the initial models.

### Disenrollment Patterns

The overall unadjusted annual rate of disenrollment from PACE was 7.7%. During the first 3 years of each site's existence, the annual risk of disenrollment from the demonstration sites was 7.8% compared with 12.4% for the replication sites ( $P < 0.0001$ ). In subsequent years, the former showed a disenrollment rate of 5.9% per year, with the latter showing a rate of 12.0% ( $P < 0.0001$ ).

Figure 1 shows the smoothed hazard functions for each group separately, controlling for patient risk factors. Both hazards initially increase, peaking at 6 to 7 months, and gradually decline thereafter. Hazard for enrollees of the

**TABLE 1.** PACE Participant and Program-Level Characteristics

Characteristics	Mean (SD)
<b>Participant (n = 14,657)</b>	
Predisposing	
Age (years)	78.5 (9.2)
Gender	
Men	29.0%
Women	71.0%
Education (years)	8.8 (4.2)
Race/ethnicity	
White	48.0%
Black	28.0%
Hispanic	15.0%
Asian	7.0%
Other/missing	2.0%
Residence	
Group home	15.0%
Social support	
No informal caregiver	14.4%
Household caregiver present	45.8%
Non-household caregiver only	34.3%
Unknown caregiver status	2.8%
Enabling	
Medicaid eligible	
With SSI	35.0%
Without SSI	54.0%
Private pay	11.0%
Enrolled in dually capitated program	90.7%
Age of program at enrollment (years)	6.0 (3.4)
Health status	
ADL loss	
Early (grooming, dressing, bathing)	2.6 (1.8)
Middle (toileting, transferring, walking)	1.6 (1.9)
Late (feeding)	0.3 (0.52)
Perceived health status	
Excellent	8.0%
Good	45.6%
Fair	27.9%
Poor	8.1%
Unknown	10.4%
Cognitively impaired	
Bladder incontinent (scale 0–2)	0.90 (0.88)
Bowel incontinent (scale 0–2)	0.35 (0.67)
Behavioral problems (scale 0–2)	
Wandering	0.20 (0.54)
Verbally disruptive	0.18 (0.49)
Physically aggressive	0.08 (0.33)
Regressive behavior	0.16 (0.47)
Diagnoses	
Cancer	10.8%
Congestive heart failure	18.3%
Other cardiac	50.8%
Pulmonary	24.0%
Cerebrovascular	30.7%
Depression/anxiety	34.1%
Diabetes	29.7%

Characteristics	Mean (SD)
Renal failure	8.9%
Psychosis	5.5%
Other mental	7.5%
Health service use	
Treatments	
Chronic	7.8%
Acute	33.3%
No. hospital admissions (last 180 d)	0.28 (0.66)
No. nursing home days (last 180 d)	3.85 (17.2)
<b>Program</b>	
Calendar year of enrollment	1998 (2.9)
Day center aides, FTEs/100 participants	20.3 (11.2)
Home care workers, FTEs/100 participants	13.8 (10.5)
Professional staff, FTEs/100 participants	10.6 (3.7)
Program sponsorship	
Community-based system	58.3%
Hospital/LTC system	20.8%
Stand alone	
Team Performance Score (1 = worse; 5 = best)	4.2 (0.23)
2001 nursing home beds/1000 residents	7.2 (2.9)

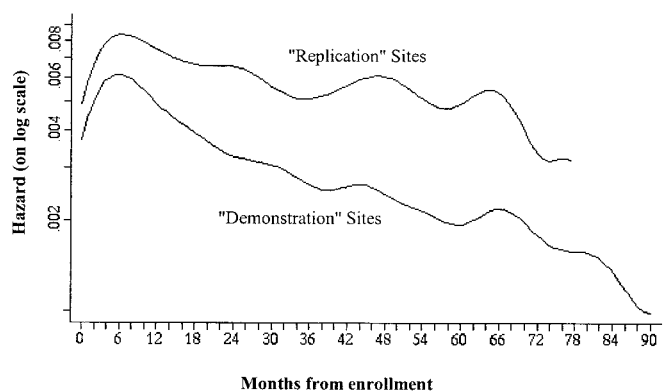
FTE indicates full-time equivalents; LTC, long-term care.

replication sites remains higher, compared with the demonstration sites, and the difference increases over time.

**Participant-Level Predictors of Disenrollment**

The final estimated survival model is shown in Table 2. After controlling for all the covariates, only 11 from the original list (in Table 1) appear to significantly predict disenrollment from PACE. Participant-level predictors that significantly increase the risk of disenrollment include: being Hispanic, private pay, poorer self-assessed health, wandering and verbally disruptive behaviors, hospitalizations, and nursing home stay. Predictors, which are significantly protective of disenrollment include residence in a group home and receipt of acute and chronic treatments.

Because we used fractional polynomials to obtain the best functional form to model the effect of nursing home days



**FIGURE 1.** Smoothed hazard functions by program status: adjusted for patient-level covariates. For example, the hazard 0.006 corresponds to probability of disenrollment  $1 - \exp(-0.006)$  during 1 month and is close to 0.006.

**TABLE 2.** Relative Risk for Disenrollment From PACE: Proportional Hazard Model

Predictor Variables	Category/Definition	Hazard Ratio	P	95% HR CI Limits
Enrollee characteristics				
Predisposing factors				
Race/ethnicity	All other*			
	Hispanic	1.26	0.001	1.10–1.44
Residence	All other*			
	Group home	0.52	0.000	0.45–0.61
Enabling factors				
Medicaid status	Medicaid, SSI*			
	Medicaid, not SSI	0.92	0.074	0.84–1.01
	No Medicaid (private pay)	2.11	0.000	1.81–2.45
Health status				
Perceived health status	Fair-to-excellent*			
	Poor	1.45	0.000	1.28–1.64
	Unknown	1.25	0.000	1.13–1.39
Wandering behavior	Never or sometimes*			
	Often	1.29	0.000	1.12–1.48
Verbally disruptive behavior	Never*			
	Sometimes or often	1.25	0.000	1.13–1.38
Diagnoses	Cardiac (other than congestive heart failure)	0.93	0.071	0.86–1.01
	Depression/anxiety	1.08	0.068	0.99–1.17
	Diabetes	1.08	0.062	1.00–1.18
Health service use				
Nursing treatments	Acute (none*)	0.82	0.000	0.76–0.90
	Chronic (none*)	0.81	0.006	0.70–0.94
Hospital admissions (last 180 d)	None*			
	Hospital admissions, 1	1.44	0.000	1.29–1.61
	Hospital admissions, 2 or more	1.90	0.000	1.63–2.21
Nursing home days (last 180 d)	0 nursing home days*			
	1st fractional polynomial <sup>†</sup>	1.28	0.000	1.24–1.33
	2nd fractional polynomial <sup>‡</sup>	0.84	0.000	0.80–0.88
Interaction with private pay	1st fractional polynomial <sup>†</sup> × private pay	0.87	0.001	0.80–0.94
Program characteristics				
Program status indicator	“demonstration”*			
	“replication”	1.46	0.010	1.09–1.95

\*Reference category.

<sup>†</sup>log (nh days + 1)/100 – log(0.01).

<sup>‡</sup>log (nh days + 1)/100<sup>3</sup> – log(0.01)<sup>3</sup>.

Estimated variance of frailty for model with participant and program characteristics: estimate = 0.133; SE = 0.039; P < 0.000.

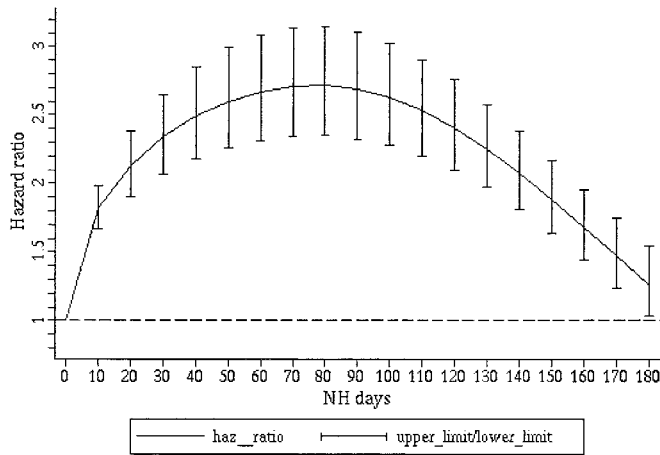
on disenrollment and for the interaction between nursing home days and Medicaid eligibility, the interpretation of the proportional hazard model with respect to this covariate, and its interaction term, is more complex. To aid in the interpretation, the function for the fractional polynomial terms and 95% confidence intervals, are depicted in Figure 2. The hazard of disenrollment is higher for enrollees with any number of nursing home days compared with enrollees with no nursing home days. The hazard ratio increases with longer nursing home length of stay until approximately 80 to 90 days, whereupon it begins to decline.

Table 3 depicts the effect of Medicaid eligibility on risk of disenrollment by different levels of nursing home lengths of stay. Enrollees who are private pay appear to be significantly more likely to exit than those who are Medicaid eligible but only when a nursing home stay is relatively short

(less than 1 month). These enrollees have more resources/options for disenrolling and finding alternative sources of health care, including a broader choice of nursing homes. However, for nursing home stays longer than 30 days, the differential in the hazard between those who are and who are not eligible for Medicaid begins to narrow and becomes statistically insignificant.

### Program-Level Predictors of Disenrollment

After adjusting for individual risk factors only the program status variable had a significant effect on disenrollment (Table 2). Adding the program status indicator to the model reduced the variability across sites (expressed by variance of frailty) by 20%, from 0.167 (SE 0.047, P value 0.000) to 0.133 (SE 0.039, P value 0.000). There remains substantial variability between PACE sites that is not ex-



**FIGURE 2.** Effect of nursing home stays on medicaid eligible enrollees: disenrollment hazard ratios by number of nursing days adjusted for patient-level covariates.

plained by the site characteristics included in the analyses. The estimated frailty, which can be thought of as hazard ratios for a given program compared with the average site, ranges from 0.52 to 1.84.

**DISCUSSION**

To our knowledge, this is the first study to examine patterns and predictors of disenrollment in PACE. The PACE model, which combines Medicare HMO coverage of hospital, physician, and ancillary services with full chronic care (eg,

nursing home and home care) and other expanded benefits to serve frail older persons,<sup>1</sup> has been expected to be better at meeting the special needs of this population and consequently to also have low rates of disenrollment.

Indeed, our findings document a comparatively low annual rate of disenrollment from PACE (7.7%), suggesting that enrollees are generally quite satisfied with the care they receive.

With regard to selective disenrollment, ie, disenrollment that is skewed by enrollee characteristics, our findings are more complex. Unlike many previous studies of disenrollment from managed care, we find no increased risk of disenrollment because of age, functional or cognitive impairment, Medicaid eligibility, or diagnoses. Some attributes, such as receipt of nursing treatments or residence in a group home appear to be significantly protective of disenrollment. Other attributes, such as being Hispanic, poor self-reported health, and behavioral problems seem to somewhat increase the disenrollment hazard. Several other predictors, ie, private pay status, nursing home stays and hospital admissions, substantially increase, by 2-fold or more, the risk of disenrollment from PACE.

The majority of PACE enrollees are Medicaid eligible and, for them, the impact of nursing home stays on the risk of disenrollment from PACE is particularly striking. Enrollees with 70 to 90 days of nursing home care are significantly more likely to exit the program than are those with substantially lower or substantially greater lengths of stay. We offer 2 potential explanations for this observation. The first explanation is related to patient/family preferences. After a brief stay in a nursing home, patients or their families may decide that institutional care has become necessary and/or preferable to the community-based care. When such preference is not compatible with the program’s plan of care, disenrollment is likely to follow. Furthermore, it is plausible that such disenrollment occurs because PACE programs limit their enrollees’ access to nursing homes to those with which they specifically contract for care. As the need for nursing home care arises, and permanent placement is anticipated, enrollees may wish to transfer to a nursing home of their choice, eg, with a particular religious affiliation. Currently there are no regulations requiring PACE programs to have contracts with a specific number of nursing homes. Indeed, requiring programs to expand their networks to include more nursing homes may have undesirable quality of care consequences. With the expansion of the network programs may have less leverage to negotiate rates with a nursing home or to negotiate specific practices such as the continued involvement of PACE clinical staff in the care of their patients.

Private pay status increases the disenrollment hazard by more than 2-fold. These enrollees, unlike those dually eligible for Medicare and Medicaid, have more resources and therefore greater access to alternative services and providers. They may wish to disenroll because the actual cost of services they receive, at the time, may be lower than the cost of their PACE premium. Because they pay the equivalent of PACE Medicaid capitation out-of-pocket, they may feel “entitled” to more, or a different mix, of services than the program staff believe

**TABLE 3.** Estimated Disenrollment Hazard Ratios (and 95% CI): Private Pay Participants Compared With Medicaid Eligible\* by Number of Nursing Home Days

Nursing Home Days	Hazard Ratio	95% Confidence Intervals (CI)	
		Lower Limit	Upper Limit
0	2.11	1.81	2.45
10	1.51	1.24	1.84
20	1.38	1.09	1.75
30	1.31	1.01	1.7
40	1.26	0.95	1.67
50	1.22	0.91	1.64
60	1.19	0.89	1.62
70	1.17	0.85	1.61
80	1.15	0.83	1.59
90	1.13	0.81	1.58
100	1.11	0.79	1.57
110	1.10	0.77	1.56
120	1.09	0.76	1.55
130	1.07	0.75	1.54
140	1.06	0.74	1.54
150	1.05	0.73	1.53
160	1.04	0.72	1.52
170	1.03	0.71	1.52
180	1.03	0.70	1.51

\*Categorically eligible.

are needed. These enrollees are also more likely than those Medicaid eligible to disenroll from PACE while using short-term nursing home care, perhaps because of their dissatisfaction with the particular nursing home affiliated with the program or because they prefer home/community-based services and are dissatisfied with their current plan of care. At the same time, private pay enrollees are just as likely as are the Medicaid eligible to remain in PACE once they experience longer nursing home lengths of stay. For these participants, fee-for-service nursing home care would be considerably more expensive than their private pay PACE premiums because the Medicaid portion of the capitation premium, which they are obliged to pay, is typically 20% lower than the monthly cost of a nursing home.<sup>31</sup>

Currently, PACE primarily serves people who are dually eligible, and the program has been criticized for its lack of appeal and inability to attract the Medicare-only enrollees for whom the private pay premiums, although substantially less than the cost of care in a nursing home, are often very expensive.<sup>32</sup> Although greater private pay enrollment in PACE may be desirable from the public policy perspective, our results suggest that greater enrollment of private pay individuals is likely to increase rates of PACE disenrollment. Enrollment of privately paying individuals in PACE is marginal at this time (fewer than 10% of the enrollees), so this issue is not of paramount importance. However, if PACE programs were to become successful in the private pay market<sup>2</sup> this type of selective disenrollment may merit watching.

The risk of disenrollment associated with having hospital admissions is also considerable. Although this relationship is not immediately explicable, it may be important to examine the quality of care management surrounding hospitalizations in PACE. Programs may want to evaluate such hospital-related processes as the extent of continuity of care provided by PACE physicians in the hospital versus care that may be provided by hospitalists, involvement of PACE program staff in hospital discharge planning, or access to and the quality of posthospital care.

After adjusting for patient characteristics only one program-level variable was a significant predictor of disenrollment. Being in the demonstration sites appears to be protective of disenrollment relative to the replication sites. Because many of the replication sites already have considerable operational experience and because the impact of this program variable on disenrollment appears to have persisted over time, it would be difficult to ascribe the observed association to program maturity. Furthermore, we control for the age of the program in the hazard model. Although the actual explication of this relationship is beyond the scope of this study, we speculate that the demonstration programs, composed of provider organizations that pioneered the PACE movement, may be different in their commitment to the overall philosophy of care delivery. Perhaps this translates into the demonstration programs being better at targeting of enrollees, at providing clearer explanation of program-specific features thus minimizing misunderstandings on the part of the enrollees about how the program operates, and/or providing better care, all of which are likely to contribute to lower disenrollment.

Two caveats should be noted. First, we cannot distinguish between disenrollment that results from poor management and quality of services and that which occurs as a result of specific patient preferences (eg, preference for own physician). Data on reasons for disenrollment, which may shed some light on this issue, are collected in PACE but are insufficiently specific and often missing, and we have decided not to use them. Second, although we have included several program-level predictors, there remains substantial unexplained variation in the risk of disenrollment between the programs. This warrants further exploration of program-level characteristics that are beyond the scope of the current study.

In summary, other studies have shown that in Medicare HMOs disenrollment works in favor of the plans as enrollees with higher levels of frailty have a greater probability of disenrolling than those who are healthier. Our study shows no disproportionate disenrollment from PACE among the very old participants and those who are functionally or cognitively impaired. However, several other enrollee characteristics, and some program-level attributes, appear to increase the risk of disenrollment from PACE. To further minimize disenrollment, programmatic and quality of care improvements may be needed, particularly in programs experiencing rates that are substantially greater than the average.

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