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Transitions in Care among Older Adults with and without Dementia

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Abstract

Background—Transition to nursing facilities is often viewed as the final stage of care for persons with dementia in a progression toward dependency

Objectives—Describe transitions in care among persons with dementia with attention to nursing facility transitions

Design—prospective cohort

Setting—public health system

Participants—4,197 community-dwelling older adults

Measurements—Subjects' electronic medical records were merged with Medicare claims, Medicaid claims, the Minimum Dataset (MDS), and the Outcome and Assessment Information Set (OASIS) from 2001–2008 with a mean follow-up of 5.2 years

Results—Compared to subjects never diagnosed ($n=2,674$), older adults with prevalent ($n=524$) or incident dementia ($n=999$) had greater Medicare (11.4% v. 44.7% v. 44.8%, $p<.0001$) and Medicaid (1.4% v. 21.0% v. 16.8%, $p<.0001$) nursing facility use, greater hospital (51.2% v. 76.2% v. 86.0%, $p<.0001$) and home health use (27.3% v. 55.7%, 65.2%, $p<.0001$), more transitions in care per person year of follow-up (1.4 v. 2.6 v. 2.7, $p<.0001$), and more mean total transitions (3.8 v. 11.2 v. 9.2, $p<.0001$). Among the 1,523 subjects with dementia, 74.5% of transitions to nursing facilities were transfers from hospitals. Among transitions from nursing facilities, the conditional probability was 41.0% for a return home without home health care, 10.7% for home health care, and 39.8% for a hospital transfer. Among subjects with dementia with a 30-day rehospitalization, 45% had been discharged to nursing facilities from the index hospitalization. At time of death, 46% of subjects with dementia were at home, 35% in the hospital, and 19% in a nursing facility.

Conclusion—Patients with dementia live and frequently die in community settings. Nursing facilities are part of a dynamic network of care characterized by frequent transitions.

Elements of Financial/Personal Conflicts	*Author 1 Christopher M. Callahan		Author 2 Greg Arling		Author 3 Wanzhu Tu		Author 4 Marc B. Rosenman	
	Yes	No	Yes	No	Yes	No	Yes	No
Employment or Affiliation		X		X		X		X
Grants/Funds	X		X				X	
Honoraria		X		X		X		X
Speaker Forum		X		X		X		X
Consultant		X		X		X		X
Stocks		X		X		X		X
Royalties		X		X		X		X
Expert Testimony		X		X		X		X
Board Member		X		X		X		X
Patents		X		X		X		X
Personal Relationship		X		X		X		X

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Employment or Affiliation		X		X		X
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INTRODUCTION

An estimated 4.5 million Americans suffer from Alzheimer's disease and related dementia

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and this number is expected to triple by 2050.(1–3) The Alzheimer’s Association estimates the annual cost of the disease at \$180 billion per year. Patients, families, and providers struggle with the stigma and fear of the illness and this may contribute to poor recognition, poor advanced care planning, and a feeling of isolation.(4) Family caregivers provide the majority of hands-on care to older adults with dementia and most of this care is provided in community settings. Despite the magnitude of this problem, many basic questions regarding the appropriate approach to diagnosis, treatment, and the organization of health care services for older adults with dementia remain unanswered.(4)

Federal and state payers often view nursing facility use as a target to reduce the overall cost of care,(5, 6) and patients and families also prefer community-based care.(7, 8) A wealth of extant literature focuses on the use of nursing facility services by persons with dementia. This literature suggests that the majority of patients with dementia will utilize nursing facility care,(9, 10) the majority of nursing facility residents suffer from dementia,(11) and the majority of older adults who die from dementia die in a nursing facility.(12) These observations may obscure the reality that most patients with dementia live in the community and that many patients may use nursing facilities transiently and for conditions other than dementia. A systematic review of the literature reported that dementia is the strongest independent predictor of institutionalization.(13) However, the reasons for nursing facility use for any given patient are often multi-factorial, including comorbid conditions, social factors, local health system resources, subacute rehabilitation, payment regulations, and even the caregiver’s health.(14–17) The current study does not address predictors of nursing facility use but rather seeks to provide a broader picture of transitions in care across the continuum of care and across the long course of the illness.

Care for patients with dementia is provided in the home by family caregivers, home health care agencies, and community service providers, as well as in ambulatory care clinics, hospitals, rehabilitation facilities, and nursing facilities. Movement across the continuum of care is not necessarily linear from home to hospital to permanent institutionalization. There are few prior studies describing the dynamic movement of older adults with dementia into and out of sites of care. Transitions in care represent a challenge to patients, families, and providers, and each represents increased risk of medical errors and inefficiency.(18) Problematic transitions in care are part of the rationale for care management programs as well as new models of care such as accountable care organizations and patient-centered medical homes.(19–21) The objective of this study is to gain a more complete understanding of the frequency and type of transitions in care among older adults with and without dementia, giving particular attention to transitions to and from nursing facility care over time.

METHODS

This study was approved by the Indiana University Purdue University- Indianapolis Institutional Review Board and the Centers for Medicare and Medicaid Services Privacy Board. Because the present study focuses on a longitudinal description of transitions in care across all sites of care, we merged local electronic medical record data (22) with data from four additional databases from 2001–2008: (1) Medicare claims; (2) Resident Level Minimum Data Set (MDS); (3) Outcome and Assessment Information Set; (OASIS); and (4) Indiana Medicaid claims. We report hospital, home health care, and nursing facility use and transitions, as well as mortality from the time of the subject’s enrollment through December 2008.

The study cohort is a population of 4,197 primary care patients who were screened for cognitive impairment at the time of primary care appointments from May 2001 to June

2004. (23–25) Because this screening cohort anchored subjects in time as community-based patients receiving primary care from the targeted health care system, we were able to link these patients' electronic medical record data with the additional databases described above. The study site is Wishard Health Services, an urban public health system serving medically indigent patients in Indianapolis. Wishard Health Services includes a 350 bed hospital and a network of eight primary care centers in Indianapolis. It has a Senior Care program staffed by faculty in an academic geriatric medicine program which includes services such as an Acute Care for Elders Unit, a physician house calls program, and specialty geriatric ambulatory care services.(26) Although Wishard is the site where patients were initially enrolled, the Medicare, Medicaid, MDS, and OASIS data capture the patients' utilization for any other provider or hospital. We identified prevalent cases of dementia based on International Classification of Disease (ICD) codes available in any of the linked datasets on or before the subject's enrollment.(27) The ICD codes included were 290.0-290.43, 291.2, 294.0-294.9, 331.0-331.9, 333.0, and 797. Incident cases of dementia were based on these same codes with the onset date defined by the first appearance of the code after enrollment in any of the linked datasets. In a study accessing only Medicaid claims, this approach had a specificity of 84% and a sensitivity of 69%.(27) Here we access these codes across five different datasets, not simply Medicaid. The electronic medical record contained the first record of the dementia diagnosis for 24% of the cases and Medicare claims had the first record of a dementia diagnosis for 74%, while Medicaid, MDS, and OASIS data first identified the case less than 2% of the time. Subjects not diagnosed as either prevalent or incident dementia cases by these methods were considered "never demented". Baseline comorbid conditions were identified through the same methods using data from all of the linked datasets.

The study sample was stratified into prevalent, incident, and no dementia as described above. We first compared the demographic and clinical characteristics of the three groups using chi-square tests for categorical variables, and a generalized linear model with stratum indicator for numerical characteristics, including counts. Second, we examined the relationships between dementia diagnoses and time to death or nursing home admission. We compared the distribution of the times from dementia diagnosis to death, first nursing facility placement, and first short (< 90 days) or first long-stay (> 90 days) nursing facility care using log-rank statistics. Kaplan-Meier estimates of the survival curves were depicted for these time distributions. We used Cox proportional hazard models to examine whether dementia diagnosis was an independent predictor of time to nursing facility placement or death when models controlled for demographic variables and comorbid conditions.

Third, we examined relationships between dementia diagnosis and nursing facility utilization and care transitions. Total length of nursing facility stay, annual percentage of patients with nursing facility use, and total numbers of care transitions were summarized. The probability of outbound and inbound transitions in care (including death as a final inbound transition) was calculated and results presented graphically for subjects with dementia. For incident cases, these models only include the observation windows on and after the initial diagnosis of dementia. For transitions, we include only those transitions between home, home with home health care, nursing facility, and hospitals. Transfers to emergency rooms were not included nor were transfers within facilities such as between intensive care unit and ward settings.

Fourth, we conducted sensitivity analyses to explore if our findings were robust using an earlier date to mark the onset of dementia. For example, it is recognized that dementia diagnoses may be delayed. In these sensitivity analyses, the incident cases were presumed to be demented over the entire observation window. Finally, we present a more fine-grained picture of complex transition patterns as defined by more than one site transition over time

(e.g. hospital to nursing facility to hospital). All analyses were performed using SAS Version 9.2. P values less than or equal to 0.05 were considered as statistically significant.

RESULTS

Description of the patient population and aggregate health care use

Clinical characteristics are shown in Table 1. At baseline, subjects with prevalent or incident dementia were older and were more likely to have comorbid chronic conditions. Nearly half the sample (49%) had at least one Medicaid claim. Table 2 shows the aggregate health care utilization across sites of care. Subjects with prevalent and incident dementia accumulate more hospital, nursing facility, and home health care use. Patients with prevalent and incident dementia accrue both more Medicare and Medicaid nursing facility days. The cumulative effect of this increased use is also reflected in the number of accrued transitions between sites. Prevalent and incident dementia subjects had a greater mean number of total transitions compared to those never demented (9.2 v. 11.2 v. 3.8, $p < .0001$). Notably, 42% of subjects without dementia had no transitions from home over the entire observation window as compared to only 13.7% and 9.0% of prevalent and incident patients, respectively.

Rate and timing of nursing facility use and death

Patients diagnosed with dementia were more likely to die and had earlier times to death (hazard ratio 3.02; 95% CI 2.69–3.40). Figure 1 displays the time to first nursing facility use among those with and without dementia. In this figure, prevalent cases are assigned their enrollment date as the onset of the dementia while incident case are assigned the date of their first dementia diagnosis. Patients diagnosed with dementia had earlier times to first nursing facility use (hazard ratio 6.24; 95% CI 5.49–7.10). In sensitivity analyses, we also examine nursing facility use based on time of enrollment into the study rather than time of initial diagnosis. Patients ever diagnosed with dementia had earlier times to: short stay (hazard ratio 4.50; 95% CI 3.95–5.14); long stay (hazard ratio 14.96; 95% CI 11.05–20.23); Medicare-paid (hazard ratio 5.02; 95% CI 4.40–5.74); and Medicaid-paid (hazard ratio 8.95; 95% CI 7.07–11.33) nursing facility stays. We also calculated the percent of patients using the nursing facility in each year following their initial dementia diagnosis. Rates of nursing facility use climb progressively over six years among patients with dementia beginning with a 9.9% rate in the first year following their initial dementia diagnosis and rising to 22% rate in the sixth year of observation. In contrast, in six years of observation, the rate of nursing facility use among those without dementia only varies between 2.4% and 3.4% per year.

Because patients with dementia are older and have more comorbid chronic conditions, we also completed Cox proportional hazard models controlling for age, gender, race, and the comorbid conditions listed in Table 1. Controlling for these variables, dementia remained a significant risk factor for death (hazard ratio 2.38; 95% CI 2.10–2.69), first nursing facility use (hazard ratio 5.39; 95% CI 4.70–6.18), and first long-stay nursing facility use (hazard ratio 14.93; 95% CI 11.12–20.06). Finally, because subjects could develop incident cases of the comorbid conditions, we repeated these analyses using an indicator of whether the patient was ever diagnosed with any of the chronic conditions over the entire observation window in any of the assembled databases. Dementia remained an independent predictor of death, first nursing facility use, and first long stay nursing facility use in these models controlling for both prevalent and incident common comorbid conditions.

Transition probabilities between sites of care

Figure 2 displays the outbound (transitioning out of the site) and inbound (transitioning into the site) probability of a transfer between two sites of care for older adults following their initial diagnosis of dementia. Probabilities are conditional on the subject moving from one

site to another among all transitions to or from that site. For example, for all transitions out of the nursing facility for patients with dementia (n=2015 transitions), the conditional probability is 39.2% that these transitions will be a return home without formal services, 9.4% will be a transfer home with home health services, and 43.9% of these transitions will be to the hospital. For all transitions from home for patients with dementia without home health care, 53.9% of these transfers are to hospital care. Among inbound transitions, we note the large percentage of inbound transitions (73.7%) to the nursing facility from the hospital for patients with dementia. Also, for a patient with dementia with a hospitalization, the conditional probability for a return home without formal services is 40%.

Not shown in Figure 2 are the transitions to death. There were 610 deaths among the patients with dementia; 39.7% died at home with or without formal services, 35.4% died in the hospital, and only 24.9% died in a nursing facility. Although most subjects with dementia did not die in the nursing facility, we investigated how often patients who died were transferred from the nursing facility to another site just prior to death. There were 80 subjects (13.1% of those with dementia who died) with dementia transferred from the nursing facility to the hospital who subsequently died in the hospital and 40 subjects (6.6% of those who died) transferred from the nursing facility to home who subsequently died at home; among these 40 subjects, 23 (57%) died within 30 days of returning home. Also not shown in Figure 2 is the number of subjects who had a transition to a nursing facility but had no other transitions. There were 152 subjects who transitioned from the nursing facility to death with no other transitions in between and 126 subjects who were in the nursing facility at the end of our observation window and had not had any other transitions.

Transitions in care among long-stay nursing facility residents

Given that many short stay nursing facility stays likely represent subacute rehabilitation, we also examined whether long-stay nursing facility stays (>90 days) are associated with frequent transitions in care. There were 336 subjects with dementia who ever had a long-stay nursing facility stay. Only 36 subjects (10.7%) had no observed transitions out of a long-stay nursing facility stay. Among those with dementia who had a transition in care from a long-stay nursing facility stay, the conditional probability for a transition to home was 35%, to home health care was 7.7%, to hospital was 44.0%, and to death was 6.3%.

Compound transitions beginning with transition from the nursing facility

Figure 2 shows conditional probabilities of transitions between two sites. However, some patients “ping-pong” between sites of care; this data is not easily seen in Figure 2. We refer to these as compound transitions. The most frequent compound transitions from nursing facilities were those from nursing facility to hospital and then back to a nursing facility. Among 1523 subjects with dementia, 297 (20%) subjects accounted for 728 instances of this pattern. The second most common compound pattern was from the nursing facility directly to home (with or without formal services) followed next by a hospitalization. There were 215 (14%) subjects who accounted for 270 instances of this pattern. The third most common pattern of compound transitions was from the nursing facility to home with a subsequent return to the nursing facility. There were 146 (10%) subjects who accounted for 323 instances of this pattern.

Compound transitions beginning with transitions from the hospital

The 1,113 (73%) subjects with dementia with one or more hospitalizations generated a total of 3,781 hospitalizations. Among these 1,113 subjects, 323 (29%) subjects accounted for 752 transitions from the hospital to a nursing facility, which was then followed by a subsequent hospitalization. Among all older adults with dementia, 426 (28%) subjects accounted for 851 hospitalizations which were followed by a 30-day rehospitalization. The

30-day rehospitalization rate among older adults with dementia was 23%. Among these 851 30-day re-hospitalizations, 143 (17%) were discharges from the index hospitalization to home with home health care services, 324 (38%) were discharges to home without home health care services, and 384 (45%) were discharges to a nursing facility. Thus, the 30-day rehospitalization rate for older adults with dementia discharged to home with home health services was 3.8%; to home without home health services was 8.6%, and to nursing facilities was 10.2%. In 51% (384/752) of the situations when the transition pattern for a patient with dementia was from hospital to nursing home back to hospital, the re-hospitalization was within 30 days. Moreover 25.3% (384/1519) of *all* discharges for patients with dementia from the hospital to a nursing home were followed by re-hospitalization within 30 days.

DISCUSSION

To our knowledge, this study represents the first time clinical data from an electronic medical record have been combined with Medicare, Medicaid, MDS, and OASIS data for a cohort of community-dwelling older adults. These data highlight the burden of the sheer number of transitions in care including the dynamic nature of movement into and out of nursing facilities for older adults with dementia. These data also demonstrate the complex, inter-dependent, longitudinal patterns of transitions between nursing facilities, hospitals, and homes. Patients with dementia still receive a majority of their care in community settings and even patients accruing long-stay nursing facility stays frequently return home. When these patients return home from the nursing facility, many appear to rely only on informal caregivers given the number of patients who return home without evidence of formal in-home services. The majority of patients with a diagnosis of dementia in this cohort did not die in a nursing facility. Older adults with dementia generate more transitions in care in part because they receive more care in general. Each transition presents a new risk for miscommunication, duplication of services, medical errors, or provision of care in conflict with the patient's and family's goals of care.(18) Taking a population or health systems perspective of managing care for older adults with dementia, many patients with dementia who utilize nursing facility care will not stay there for the duration of their dementing illness.

To provide collaborative care management for older adults with dementia, or to care for these patients within accountable care organizations or patient-centered medical homes, more attention will need to be directed to care within the nursing facility as a transitory site of care and as an extension of acute care. This is true not only because of the changing role of nursing facilities in terms of providing subacute rehabilitation, but also because patients in nursing facilities are often transferred back to hospitals, and hospitals are often the port of entry into nursing facilities. For example, programs seeking to decrease the rate of 30-day rehospitalizations among this cohort would need to focus particular attention on patients returning to the hospital from a nursing facility because nursing facilities were the most frequent interim site for 30-day rehospitalizations. Jencks et al. reported a 19.6% rehospitalization rate among a national sample of Medicare beneficiaries with a 17.7% rate in Indiana.(28) Our data demonstrate a rehospitalization rate of 23% among older adults with dementia with the most common interim site of care being nursing facilities.

Because delaying institutionalization is a high priority for patients, providers, and payers, new models of dementia care and new therapeutic strategies often use the rate or timing of nursing facility care as a key outcome indicator.(24, 29–37) However, this outcome is problematic for three reasons. First, studies vary in their definitions and use of terms such as nursing home care, institutionalization, long-term care, or permanent nursing facility placement. Second, the reasons for nursing facility use for any given patient with dementia are often multi-factorial, including medical conditions other than dementia.(14–17, 38) In

the models presented here, dementia is a strong predictor of nursing facility use and death but this relationship is partially attenuated when the models account for comorbid conditions. Third, nursing facility care is not necessarily inappropriate for any given patient with dementia and could represent good care or the lowest cost alternative.(39) Much like the movement toward identifying preventable or inappropriate hospitalizations, the field of dementia care needs a better metric of appropriate use of nursing facility care.(40)

Prior research has demonstrated that older adults with dementia generate excess health care costs and that older adults with comorbid conditions and dementia accrue greater health care costs than those patients with comorbid conditions without dementia.(41) However, there are few prior studies presenting transition data similar to those reported here. Welch et al. assessed prospective nursing home and hospital utilization among 126 patients assembled from an Alzheimer Disease registry and reported higher rates of nursing home use than those reported here.(9) Subjects were followed for 7–9 years; 75% of patients eventually used some nursing facility care, and 70% died. That study was not designed to report transitions between sites over time. Using four years of data from the Medicare Current Beneficiaries Survey, Kane and Atherly reported that older adults with dementia in the nursing home were less likely to use hospital services than those with dementia living in the community.(42) We also found that the conditional probability of a nursing home to hospital transfer was less likely than a home to hospital transfer for patients with dementia. This may reflect changing goals of care but, as suggested by Kane and Atherly, it may also reflect a substitution of services.(42) Among our cohort of older adults with dementia, patients were more likely to die in a home or hospital location than in the nursing home. This is in contrast to the findings of Mitchell et al. who used national death certificate data in 2001 to determine site of death among persons with dementia coded as the cause of death.(12) In addition to the different methods between the two studies, the concepts of dying *with* dementia as compared to dying *from* dementia are also different. Our data demonstrate that some patients are transferred from a nursing facility to home or to the hospital when death is imminent, but our data suggest that most patients with dementia who die are not in the nursing facility. Finally, Gozalo et al. recently reported nationwide MDS data suggesting that many older adults with dementia residing in nursing homes have burdensome transfers to the hospital near the end-of-life and that the rate of these transfers varies by state.(43)

The current study has limitations. First, we rely on the use of physician diagnoses to identify subjects with dementia. Dementia is known to be under-recognized among older primary care patients and the diagnosis may be delayed.(44) Misspecification of dementia, however, would tend to decrease differences between groups. In sensitivity analyses, we also reset the clock for incident cases to the beginning of the observation period making all cases prevalent cases. These analyses do not change our findings of frequent transitions. Second, we do not include emergency department visits as a transfer in the site of care unless they resulted in a hospitalization. This would also result in an underestimate of total transitions. Third, we do not necessarily observe the full course of the dementing illness for any given subject and we observe a different segment of this disease course across subjects. For most patients diagnosed with dementia, life expectancy is less than 10 years and the median survival is approximately 5 years.(45, 46) Thus, our observation window does represent a majority of the typical disease course. As noted above, reassigning patients with incident dementia as demented from the outset of the study essentially makes all patients ever demented as prevalent cases of dementia at baseline. In these analyses, all of the findings of this study remain robust. Finally, the patient population is limited to a cohort of vulnerable elders attending an urban public health system in the United States. These results may not generalize to other settings.

In conclusion, care management programs for older adults with dementia will increasingly need to manage patients across the home, hospital, and nursing facility and to assist with coordination of care and goals of care across these sites and over time.(47) Especially given the potential overlap in the content of care available across sites of care like the home, hospital, and nursing facility, the content of care within each of these sites merits as much attention as does coordination of care between sites. For states seeking to decrease Medicaid expenditures among long-stay nursing facility residents, efforts to revisit the goals of care regardless of site of care may offer more cost-saving and quality improvement opportunities than simply seeking to avoid nursing facility use. These data provide a broad overview of transitions in care over time among older adults with dementia. Future research will need to investigate the rationale, appropriateness, and outcomes of these transitions given the evolving role of nursing facility care.

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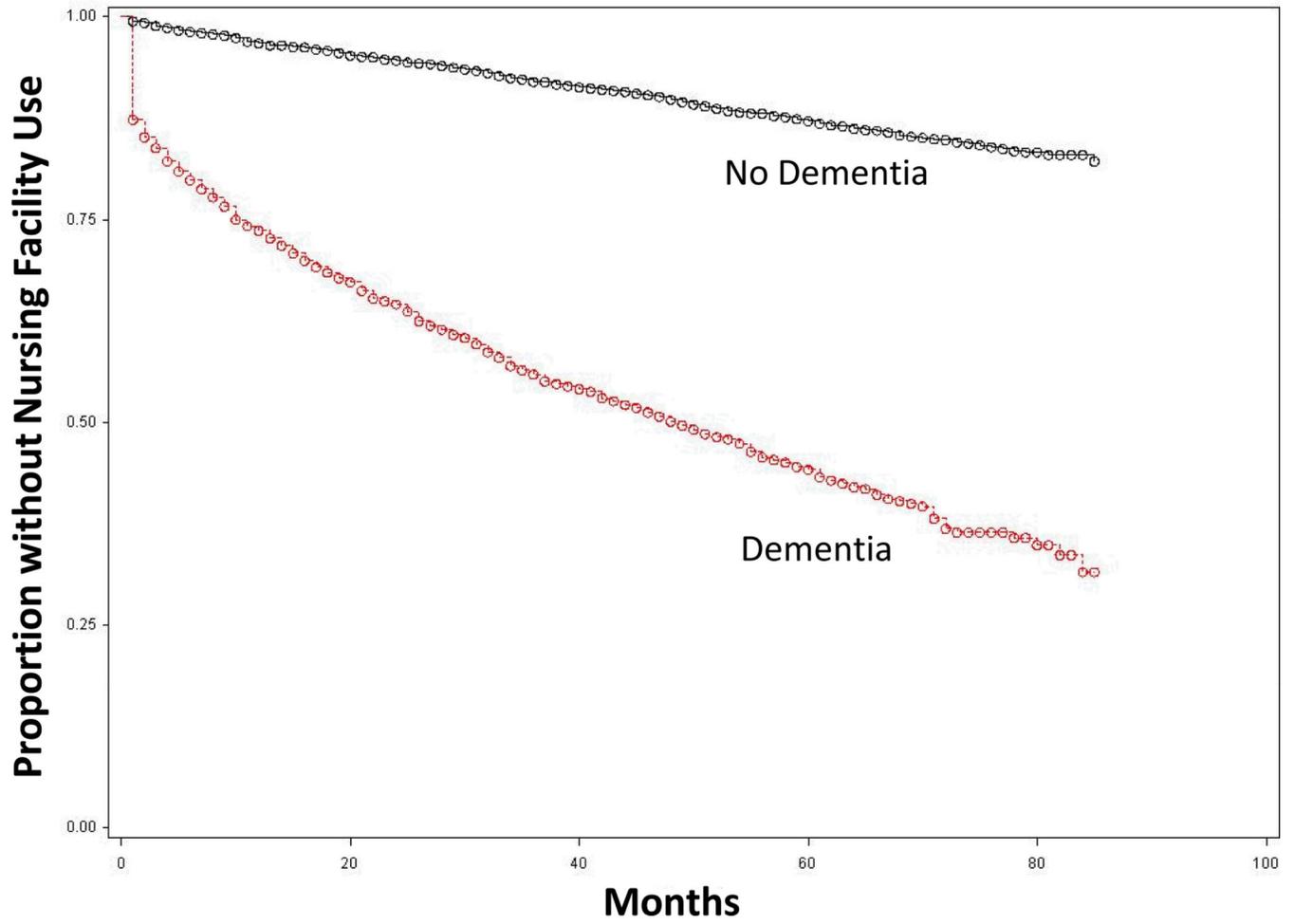


Figure 1.
Time to First Nursing Facility Use Following Diagnosis of Dementia

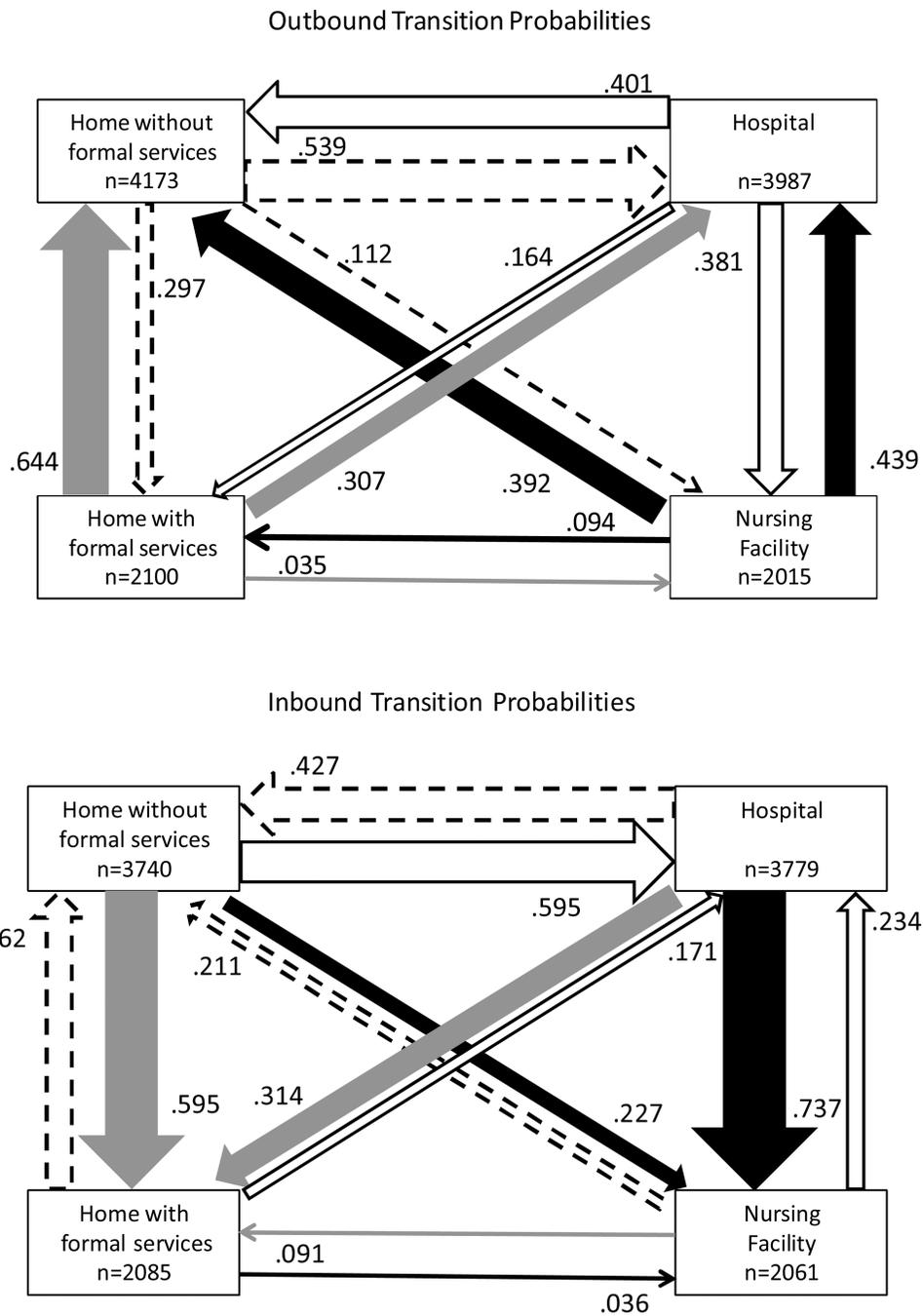


Figure 2. Transitions between Sites of Care for Subjects Following a Diagnosis of Dementia
 The denominator (n) is the number of transitions for each origin state. Transition probabilities sum to 1 for each origin state. Where sum is less than 1 for outbound transitions, remainder is the probability of transition to death (see text for transition to death rates)

Elements of Financial/Personal Conflicts	*Author 5 Steven R. Counsell		Author 6 Timothy E. Stump		Author 7 Hugh C. Hendrie	
	Yes	No	Yes	No	Yes	No
Employment or Affiliation		X		X		X
Grants/Funds	X		X		X	
Honoraria		X		X		X
Speaker Forum		X		X		X
Consultant		X		X		X
Stocks		X		X		X
Royalties		X		X		X
Expert Testimony		X		X		X
Board Member		X		X		X
Patents		X		X		X
Personal Relationship		X		X		X

* Authors can be listed by abbreviations of their names.
For "yes" xmark(s); give brief explanation below:

Table 1

Subject Characteristics

	Total sample n=4,197	Prevalent dementia N=524	Incident Dementia N=999	Never Dementia N=2,674	p-value
Demographics					
Age, mean (SD)	71.9(6.0)	75.0 (6.7)	73.4 (6.3)	70.7 (5.3)	<.0001
Female, %	68.8	64.7	71.5	68.6	.0238
Black, %	56.4	59.2	58.3	55.2	.0955
Died,%	28.0	43.1	38.4	21.2	<.0001
Comorbid conditions					
Arthritis, %	30.7	34.0	36.6	27.8	<.0001
Cancer, %	18.4	17.8	21.4	17.4	.0171
Coronary artery disease, %	20.0	30.5	25.5	15.9	<.0001
Congestive heart failure, %	12.5	17.6	16.5	10.0	<.0001
Chronic obstructive pulmonary disease, %	14.0	18.5	16.7	12.2	<.0001
Diabetes, %	27.2	30.7	33.4	24.1	<.0001
Hypertension, %	67.8	76.5	73.6	64.0	<.0001
Liver disease, %	1.7	2.5	1.9	1.5	.2488
Renal disease, %	1.3	2.5	1.8	0.9	.0064
Stroke, %	4.5	10.5	6.3	2.6	<.0001

Table 2

Aggregate Health Care Utilization

	Total sample (n=4,197)	Prevalent Dementia (N=524)	Incident dementia (N=999)	No Dementia (N=2,674)	p-value†
Subjects with any hospital stay, %	62.6	76.2	86.0	51.2	<.0001
Total hospital days accrued, mean, s.d.	16.3(28.9)	22.9 (32.0)	30.7 (39.0)	9.7 (20.3)	<.0001
Hospital admissions per year per 1000 patients	610	880	910	450	----
Hospital days per 1000 patients per year	2,590	3,910	4,950	1,510	----
Subjects with any nursing facility use, %	26.9	50.4	49.3	13.9	<.0001
Total nursing facility days accrued, mean, (s.d)	73.4 (255.7)	206.8(419.7)	158.1 (359.8)	15.5(101.7)	<.0001
Nursing facility days per 1000 patients per year	11,660	35,280	25,530	2,420	----
Nursing facility length of stay, mean	89.7(148.0)	136.5(205.2)	96.0(138.7)	48.1 (88.8)	<.0001
Subjects with Medicaid nursing facility use, %	7.5	21.0	16.8	1.4	<.0001
Total Medicaid nursing facility days accrued, mean (s.d)	35.0(173.4)	115.0(317.3)	75.8 (239.9)	4.0 (56.5)	<.0001
Medicaid nursing facility days per 1000 per year	5,560	19,620	12,240	630	----
Subjects with Medicare nursing facility use, %	23.5	44.7	44.8	11.4	<.0001
Total Medicare nursing facility days accrued, mean (s.d)	15.1 (41.9)	33.1 (58.6)	33.5 (59.2)	4.6(21.8)	<.0001
Medicare nursing facility days per 1000 per year	2,400	5,640	5,420	720	----
Subjects with any home health care use, %	39.8	55.7	65.2	27.3	<.0001
Subjects who died, %	28.0	43.1	38.4	21.2	<.0001
Person years of observation, mean (sd)	5.2(1.7)	4.7(1.9)	5.0(1.8)	5.3(1.7)	<.0001
Total number of transitions, mean (sd)	6.2 (8.2)	9.2 (9.3)	11.2(10.2)	3.8 (5.8)	<.0001