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# Effects of Green House<sup>®</sup> Nursing Homes on Residents' Families

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*A longitudinal quasi-experimental study with two comparison groups was conducted to test the effects of a Green House (GH<sup>®</sup>) nursing home program on residents' family members. The GH<sup>®</sup>s are individual residences, each serving 10 elders, where certified nursing assistant (CNA)-level resident assistants form primary relationships with residents and family, family is encouraged to visits, and professionals adapted their roles to support the model. GH<sup>®</sup> family were somewhat less involved in providing assistance to their residents although family contact did not differ among the settings at any time period. GH<sup>®</sup> family were more satisfied with their resident's care and with their own experience as family members, and had no greater family burden. Issues in studying family outcomes are discussed as well as implications for roles of various personnel, including social service and activities staff in a GH<sup>®</sup> model.*

## EFFECTS OF GH<sup>®</sup> NURSING HOMES

This article presents results of a quasi-experimental study that examined how a dramatically changed small-house nursing home model affected behavior and outcomes for residents' family members. The model of nursing home care developed in the GH<sup>®</sup> in Tupelo, Mississippi, created

opportunities and challenges for family members, and was expected to result in more positive family interactions with residents, and greater family engagement with and satisfaction with the nursing homes.

## BACKGROUND

Family members are instrumental to the psychosocial well-being of nursing home and assisted living residents, and provide the major means for residents to retain their social affiliations and relationships outside the nursing home (Kane, 2004). Families typically are integrally involved in the decision of older people to move to a residential setting, and their choice of facility (Reinardy and Kane, 1999; 2003). If reformed models of nursing homes do not meet with family approval, they are unlikely to be chosen. Further, family members are also a major source of emotional support to elderly people receiving long-term care in all settings, including group residential settings such as nursing homes and assisted living (Gaugler, Kane, and Kane, 2002; Gaugler and Kane, 2007). Family members continue to provide both tangible and emotional support to residents after so-called institutional placement (Kane et al., 1999). Family members also often take on a watchdog role, looking after their relatives' interests and promoting their quality of care (Bowers, 1988). However, the roles of family members in relationship to the nursing home are sometimes ambiguous, fraught with poor communication and misunderstandings

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between nursing home personnel and family members about mutual expectations (Friedemann et al., 1998).

Although family members typically remain engaged with their members who are nursing home residents, nursing home visits can be difficult and stilted experiences. The setting appears medical and unnatural, engendering uncertainties about what relatives are permitted to do. Also family members may feel guilty and sad because they felt the need to encourage a nursing home admission. Visits may, therefore, become brief and limited to a few relatives, with children and extended family members reluctant to visit or to risk taking the nursing home resident out of the setting to participate in community life.

The movement toward culture change and individualized services in nursing homes has led to new configurations of nursing homes that are more normalized and utilize household models (Weiner and Ronch, 2003). Little is known about how family members perceive the safety and care of the residents and the demands or benefits for themselves, when their relatives live in nursing homes with transformed housing arrangements. This article examines how family members of GH<sup>®</sup> nursing homes (compared to families of residents in conventional facilities) reacted to their relatives' moves to a radically changed nursing home.

## Intervention

GH<sup>®</sup>s are self-contained dwellings for 7-10 residents needing nursing home levels of care. The physical environment is residential, offering residents opportunities for privacy (with private rooms and full bathrooms) and participation in community life, with a residential-style kitchen where meals are prepared on site, a dining area with a large communal dining

table, a living room with a fireplace (collectively known as the hearth area), a sun room, and accessible patio and outdoor space. The GH<sup>®</sup> avoids nurses' stations, medication carts, and public address systems. The frontline care staff members, who are CNAs assigned to a single GH<sup>®</sup>, have broadened roles, including, cooking, housekeeping, personal laundry, personal care to residents, implementation of care plans, and assisting residents to spend time according to their preferences. This CNA with an expanded role is called a Shabbaz in GH<sup>®</sup> parlance, a Persian term meaning royal falcon that William Thomas used "... to connote the importance of the role of the individuals who watch over the elders [Rabig, 2008]."

All professional personnel mandated in nursing home regulations (e.g. nurses, physicians, social workers, dietician, pharmacist, therapy staff, and activity personnel) form visiting clinical support teams that provide specialized assessments and order and supervise care within their spheres of expertise. The elder assistants report to an administrator (called a guide) rather than to a nurse. Philosophically, the GH<sup>®</sup> model emphasizes individual growth and development and a good quality of life under normal rather than therapeutic circumstances. A group of GH<sup>®</sup>s on a campus or scattered in a residential neighborhood operates under a nursing home license and within a State's usual Medicaid reimbursement amounts, though a redistribution of expenditures could occur.

The first GH<sup>®</sup>s in the U.S. were built in Tupelo, Mississippi, on the campus of a faith-based non-profit retirement complex, comprised of independent housing, assisted living, and a nursing home (Cedars) licensed for 140 beds. In June 2003, the first four GH<sup>®</sup>s were opened and occupied by residents from the sponsoring nursing home; two of these GH<sup>®</sup>s were

initially earmarked for residents in the locked dementia care unit (which was then closed) and the others were occupied by residents from the general nursing home population from residents volunteering to move in and chosen in order of the length of time that the residents had been on the campus. Vacancies arising in the GH<sup>®</sup>s after the initial move-in were similarly filled by residents already in the nursing home or on the campus, again in order of length of time on the campus. Training to become an elder assistant was offered to staff at Cedars, supplemented by new hires from the community; staff who assumed these new GH<sup>®</sup> roles varied in age and length of experience in long-term care, but on average had the same demographic characteristics as nursing home CNAs regarding sex, race, education, and prior experience as all CNAs in Mississippi. Fuller descriptions of the general model, its theoretical rationale, and its first implementation in Mississippi have been published (Thomas, 2004; Rabig et al., 2006).

We undertook a large-scale, multifaceted study of the GH<sup>®</sup> that included collecting outcome data from residents, family, and frontline staff; detailed post-occupancy evaluation observations of the GH<sup>®</sup>; and a case study of the implementation of the GH<sup>®</sup>. Here we report the results for family outcomes. Reported elsewhere are the results for residents; a followup study comparing resident outcomes over 18 months to residents in two comparison settings found that GH<sup>®</sup> residents had a better perceived quality of life on numerous domains, were more satisfied with the GH<sup>®</sup> as a place to live and a place to receive care, and had no negative effect on quality of care outcomes measured by the nursing home minimum data set (MDS) quality indicators as a result of the more resident-centered care model and their increased privacy and autonomy (Kane et al., 2007).

The GH<sup>®</sup> was conceptualized as a setting where family members would feel comfortable in visiting family members in their own private home-space, and in the community shared spaces. The families were meant to be welcomed into the GH<sup>®</sup> as visitors, as guests at meals, and as part of the small purposive communities created within each GH<sup>®</sup>. The elder assistants were expected to develop primary relationships with residents' family members. The study reported here aimed to determine whether the nature of family assistance and family contacts differed for GH<sup>®</sup> families, and how families appraised their GH<sup>®</sup> experience in terms of their view of their resident's well-being and their own well-being as family members.

## METHOD

### Design

Because randomization was unfeasible, a quasi-experimental design was used; two comparison sites were identified: the sponsoring nursing home (Cedars) and another nursing home of the same non-profit owner on a similar campus in a Mississippi community about 90 miles away (Trinity). Data came from in-person interviews with residents, family members, and line staff members, and from abstraction of the nursing-home MDS (the standardized resident assessment that is completed annually for all nursing home residents and updated quarterly on key parameters) for times preceding and most proximate to in-person data collection. This report utilizes data from family members of residents, and the method and measures described here largely are, therefore, limited to the family interview component.

The two comparison groups, Cedars and Trinity, each have strengths and limitations, and both were used for a stronger

design. The Cedars group was susceptible to contamination by having a shared administration with the GH<sup>®</sup>, and was potentially influenced by the GH<sup>®</sup> planning and the ultimate goal of moving all residents to GH<sup>®</sup>s; this could have led to spin-off improvements in the Cedars group or poorer results at Cedars because of neglect of the traditional nursing home and concentration on the GH<sup>®</sup>. Although under the same ownership and experiencing similar local conditions, the two nursing homes differ in various ways. Built in 1995, Trinity is newer and smaller (65-beds) and has a small Medicare-certified unit (which was not included in the study). Cedars was built in 1975, had 140-licensed beds (120 of which were operating), had no Medicare certification, and had a 20-bed locked dementia unit. Both had adjoining assisted living settings. The nursing homes at Cedars and Trinity were both traditional in the sense that they were laid out with largely semiprivate rooms and typical units dominated by a nursing station. Both had interests in individualizing resident care. Cedars participated in Eden Alternative programs, and boasted a number of birds as pets. The non-Medicare Trinity comparison group was chosen as the best representation of the natural history of residents in a traditional nursing home setting in the same region and time period as the site of the GH<sup>®</sup> implementation. We hypothesized that family members in GH<sup>®</sup> would continue to assist their relatives, and (compared to the control settings) would be more engaged with the residents, would be more satisfied with the care of their relatives, would experience no greater family burden than in a traditional nursing home, and would perceive their own experience as family members more positively.

## Sample

### GH<sup>®</sup>

The GH<sup>®</sup> resident sample was comprised of the 40 people who were scheduled to move to the GH<sup>®</sup>s at baseline, and the current GH<sup>®</sup> census at each of the three followup periods—6, 12, and 18 months. All told, 53 GH<sup>®</sup> residents were eligible over the successive data collection periods, 52 of whom were in the sample. Ten of the GH<sup>®</sup> sample members died over the 18-month period and 2 were discharged. Seven of the new GH<sup>®</sup> residents moved from Cedars during the study and the remaining six moved either from the assisted living setting or the independent living setting on campus.

### Cedars

During the study period, Cedars was run as a 120-bed nursing home so that the maximum census remaining at Cedars at any time was 80. At baseline, we sought a random sample of 40 residents, excluding residents who were comatose, vegetative, or in end-stage palliative care; 9 of the initial group approached declined to participate. In subsequent waves, in order to acquire as much baseline data as possible from residents who might later move to GH<sup>®</sup>s, we enlarged the Cedars sample with a goal of 70 per time period. The added sample at all followup waves was randomly selected. The final Cedars sample sizes were 67, 71, and 64 for the three followup waves, with refusals from 3, 0, and 1 persons, respectively. The only live discharges from Cedars were to GH<sup>®</sup>s, affecting 7 sample members; 22 of the Cedars sample members died at Cedars during the study period.

## Trinity

Trinity had a capacity of 65 beds, 15 of which were in the Medicare unit. We sought a sample of 40 residents from the non-Medicare portion of Trinity, using the same exclusion criteria as at Cedars. The Trinity sample at the 3 followup waves was 39, 36, and 37 respectively; 66 people participated from Trinity; 18 sample members died over the 18 months and 4 were discharged alive, usually to relocate in facilities near their children.

## Family Sample

We attempted to recruit a family member for each resident. With the help of the social worker, we identified all involved family members for residents, and when we had a choice, we selected the family member most involved with the resident's day-to-day life. Family members who had no contact with the resident at all were excluded from consideration. Table 1 describes our substantial success in identifying and recruiting family members from each setting at each wave. At the GH<sup>®</sup>s, we missed from one to three family member

interviews, always because no eligible family member could be found. At Trinity, we were 100 percent successful in performing a family interview for all residents until the final wave, when five family members refused the interview. At Cedars, we experienced a relatively high rate of missing or refusing family members at 12 months (7 of 71, 2 of which were due to refusals) and at 18 months (10 of 64, 6 of which were due to refusals). Cited reasons for declining to participate in later waves at either setting were practical scheduling differences, health issues of the family respondent, or getting tired of the repetition in the interviews—this last was especially true at Trinity, which was removed from the GH<sup>®</sup> intervention under study. For the most part, the same individual identified for the family sample at the first opportunity continued with the study until the last wave of data collection or the removal of the resident from the sample because of death or discharge. One or more changes in family respondent occurred for nine GH<sup>®</sup> residents, seven Cedars residents, and Trinity residents across the four data collection times. The most usual changes were among children or children-in-law of the

**Table 1**  
**Sample of Family Members by Settings and Wave of Interviews**

Setting	Baseline		6 Months		12 Months		18 Months	
	Residence	Family	Residence	Family	Residence	Family	Residence	Family
Green Houses <sup>®1</sup>	40	39	41	38	39	38	39	36
Comparison 1, Cedars <sup>2</sup>	40	38	67	67	71	64	64	54
Comparison 2, Trinity <sup>3</sup>	40	40	39	39	36	36	37	32

<sup>1</sup> At baseline, there was one GH<sup>®</sup> sample member who had no identifiable family respondent, although at the 18 months time period, an involved family member for that resident was located. At Wave 2, 41 GH<sup>®</sup> residents were in the sample because in the elapsed time for data collection a resident was interviewed, discharged, and replaced by another. Other missing family member interviews are due to inability to identify eligible family members.

<sup>2</sup> At Cedars the missing family members at 12 months were mostly due to lack of eligible participants, although two family members refused. At 18 months, six of the missing interviews were due to refusals.

<sup>3</sup> At Trinity, the five missing family members at Wave 4 were due to refusals, all from families that had participated at earlier waves.

SOURCE: Lum, T.Y., Kane, R.A., Cutler, L.J., and Yu, T-C., University of Minnesota, 2008.

resident in situations where multiple family members were involved with the resident. In one instance at Trinity, the original family respondent, a daughter of the resident died. At each time interval, we attempted to identify a family member (and often succeeded) even if no family interview had been done during the previous wave.

## DATA COLLECTION

Data collectors were recruited for the project and received at least 40 hours of training for the various data collection procedures. Family interviews were done in-person, supplemented when needed by telephone data collection for all or part of an interview. Family baseline data were collected in the 2 to 3 weeks before any residents moved the GH<sup>®</sup>s. When that proved impossible, family baseline data were collected a few weeks after the resident moved to the GH<sup>®</sup> but all questions for the GH<sup>®</sup> sample members were anchored with the phrase “before you moved to the GH<sup>®</sup>.”

## Measures

### Family Satisfaction with Resident’s Care

Family satisfaction with the nursing home care and life was measured using 25 ratings developed for a national study of assisted living (Levin and Kane, 2006). Family members were asked to rate each aspect of nursing home care between 1 (the worst rating) and 5 (the best rating). A subsequent exploratory factor analysis grouped 22 of these 25 questions into 5 domains, namely general amenities, social environment, physical environment and privacy, autonomy, and health care. Each domain has between three and six items.

The general amenities, meals, and housekeeping domain was comprised of four rated items: a physical setting that was convenient for people with disabilities, high quality food and menus, the atmosphere and services at meal time, and the way house keeping was done (Cronbach’s alpha=0.7516) (Cronbach, 1951). The social environment domain was also composed of four rated items: the nursing home offered interesting things for residents to see and do, the nursing home helped with transportation, the nursing home provided access to religious program and counseling, and residents living here have things in common with my relative (Cronbach’s alpha=0.6971). The physical environment and privacy domain was comprised of three rated items: the nursing home provided privacy for the resident, the nursing home provided a comfortable and attractive room and bathroom, and the nursing home made it possible for residents to make use of kitchen or get food (Cronbach’s alpha=0.7454). The autonomy domain was composed of six rated items: resident say in the decoration and arrangement of his/her bedroom, resident say in how much or little care he/she got, resident say in who could come into room, resident ability to refuse care; staff members who know and like the resident; and residents liking the staff members (Cronbach’s alpha = 0.8494). The health care domain was composed of five ratings: access to professional nurses, access to physicians, ability to get help at night, help for taking medicine, and having the same people consistently providing help (Cronbach’s alpha = 0.8294). Summary scales were calculated for each domain with the theoretical score range varying from 5 to 15 (for privacy) to from 5 to 30 (for autonomy), depending on the number of items.

## Family Experience

We constructed an appraisal of family experience as consumers in their own right. Based on literature, we selected seven items for respondents to rate: (1) nursing home communication with family members; (2) nursing home success in making nursing home a pleasant place for family to visit; (3) nursing homes making family members feel welcomed; (4) nursing homes allowing family members to provide the help they wanted to provide; (5) nursing homes not expecting family to provide help they do not want to provide; (6) staff answering questions that family member might have; and (7) the nursing homes inspiring confidence in the care resident received. Family members rated each of these items from 1 (worst) to 5 (best). A subsequent factor analysis found that these seven items fitted well into one single scale (Cronbach's alpha: 0.9176). This resulted in a seven-item scale with a possible score ranging from 7 to 35.

## Family Assistance

Family assistance to the resident was measured by nine items, including: (1) taking resident out of nursing home for drives or activities; (2) doing shopping or errands for resident; (3) arranging health care or other appointments for resident; (4) helping resident with financial management; (5) doing laundry for residents at home or the nursing home; (6) helping residents get from place to place, including taking resident outside; (7) helping resident with grooming or dressing; (8) helping resident use the toilet; and (9) getting involved in the life of nursing home and assisting with programming. Family members rated each item from 6 (everyday) to 1 (not at all in the last 3 months) based on

the level of assistance they provided in the last 3 months.

## Family Burden

We measured the subjective and objective burden by using an adaptation of the Montgomery, Stull, and Borgatta (1985) burden scales. Objective burden is measured by respondents rating the effect family caregiving had on 9 items (time to yourself, privacy, money to meet expenses, personal freedom, energy, time spent in social and recreational activity, vacations and trips, time spent with other family members, and your own health). Subjective burden is measured by disagreement or agreement with 13 statements that tap emotional distress or positive emotions related to caregiving, such as "It is painful for me to watch my \_\_\_ age; I feel strained in my relationship with my \_\_\_; I feel nervous and depressed about my relationship with my \_\_\_; I feel useful in my relationship with my \_\_\_; I feel I am contributing to the well-being of my \_\_\_." Summative scales were created with a higher score signifying greater perceived caregiver burden.

## Global Satisfaction

We measured the global satisfaction of family members by three separate items: satisfaction with the nursing home as a place to live, and as a place to receive care (both on a 4-point scale from very satisfied to very dissatisfied), and likelihood of recommending the setting to others (on a 4-point scale from very likely to very unlikely).

## Contacts

Family members reported frequency of visits and phone conversations in the

6 months before the interview using the following response set: everyday, more than once a week, about weekly, less than weekly but more than once a month, about once a month, or not at all. There were no differences in either in-person or telephone contact across study groups at baseline. The in-person visit frequency was used in the analyses.

## Demographics and Functional Status

Also included in the data set was the sex of the family member, the type of relationship with the resident (i.e., spouse; adult child or child-in law, siblings, grandchildren and other [e.g., nieces and nephews, cousins]).

For case mix adjustment, activity of daily living (ADL) (bed mobility, eating, transferring, and toileting) and cognitive functioning were extracted from residents' MDS data, and calculated using methods developed by Morris and colleagues (1999; 1994; 1997).

## Qualitative Views

At baseline all family members were asked if they knew what a GH<sup>®</sup> is and an open-ended question about their understanding of that concept. At each followup period, families, residents, and frontline staff at the GH<sup>®</sup>s and comparison settings were asked a number of open-ended questions about what they liked and disliked about the GH<sup>®</sup> (or their nursing home) and about their reactions to specific aspects of the program, such as meals, housekeeping and laundry, physical care, activities, and their room and bathroom. For the purposes of this article, we supplement the quantitative data with analysis of the qualitative responses from GH<sup>®</sup> families on their perspective on GH<sup>®</sup> at baseline and their followup responses to the two most general

questions: (1) As a family member, what do you like best about your \_\_\_'s current living situation and the help he/she gets in the GH<sup>®</sup> (in this nursing home)? (2) What do you like least about your \_\_\_'s current living situation and the help he/she gets in the GH<sup>®</sup> (in this nursing home)? Finally as part of the GH<sup>®</sup> case study, we made systematic observations at different times of day in each house, and noted, among other things, the presence and activities of outside visitors.

## Analysis

The Stata Version 9 program was used for all data analyses (StataCorp LP, 2005). Selection effects were examined by comparing baseline characteristics in both independent and dependent variables for sampled family members of residents who went to the GH<sup>®</sup>, remained at Cedars, or were in Trinity. Outcomes were analyzed with multivariate panel regression analyses using the random-effects Tobit regression models (Maddala, 1987) or random-effects ordered Probit models (Frechette, 2001), the choice based on the specific analysis. These analyses used data from all three followup periods over 18 months, with waves of data collection accounted for by dummy variables. The main independent variable was the resident's status as a GH<sup>®</sup>, Cedars, or Trinity resident at the time of data collection. Data from the baseline were used only to check for selection effects. All analyses for family satisfaction, family involvement and overall satisfaction were controlled for wave of data collection, sex of family member, ADL and cognitive functioning of resident, sex of resident, and relationship with resident. Since we have repeated observations per individual and they were organized in three nursing homes, the random effects models allowed us to generate better parameter estimates

by taking account of the repetition and control for the random individual differences. We used random-effects Tobit regressions (Maddala, 1987) to estimate the effects of GH<sup>®</sup> intervention on family help, family satisfaction, and family experience, as we found from our preliminary data analysis that there are ceiling effects on these variables. We used the random effects ordered Probit regressions (Frechette, 2001) to estimate the effects of GH<sup>®</sup> intervention on the global satisfaction rating as these variables are ordinal.

## FINDINGS

### Description of Sample

Table 2 shows the characteristics of the sample at baseline. The table shows the *p*-values for the bi-variate statistical tests between GH<sup>®</sup> and Cedars samples and the *p*-values for bi-variate statistical tests

between GH<sup>®</sup> and Trinity samples. In all settings, more than three-quarters of the family respondents were female and over one-half were adult children or daughters-in-law; at Trinity, the proportion of respondents who were children increased to 72 percent. The measure of frequency of in-person visits in the previous 6 months or since the resident's admission was measured on a 7-point scale with 7 being daily and 1, not at all. The mean visit score for respondents was very similar at each setting, averaging between 4 (less than weekly) and 5 (weekly) with a standard deviation that reflected that some residents had very frequent contact from the respondents. The only significant baseline difference was in the cognitive performance scale, with the Cedars residents in the sample more cognitively impaired than GH<sup>®</sup> or Trinity. Although the entire locked dementia special care unit (SCU) unit moved to the GH<sup>®</sup> and newly admitted persons with

**Table 2**  
**Characteristics of Family Members at Baseline in Green House (GH<sup>®</sup>), Cedars, and Trinity**

	GH Mean(SD)	Cedar Mean(SD)	<i>p</i> -value	Trinity Mean(SD)	<i>p</i> -value
Sample Size	39	38	—	40	—
Relationship (Percent) <sup>4</sup>	—	—	0.701	—	—
Spouse	10.3	10.5	—	10.0	—
Children	56.4	57.9	—	72.5	—
Grandchildren	5.1	7.9	—	2.5	—
Sibling	18	7.9	—	0	—
Others	10.3	15.8	—	15.0	0.07
Female (Percent)	71.8	79.0	0.467	70.0	0.861
Visit Frequency <sup>1</sup>	4.7 (1.0)	4.6 (1.1)	0.665	4.4 (1.3)	0.259
<b>Resident</b>					
Female (Percent)	79.5	87.5	0.328	75.0	0.482
ADL <sup>2</sup> (0-16, a Higher Score Means More Difficulties)	7.1 (5.7)	8.6 (5.9)	0.259	8.4 (5.8)	0.333
Cognitive Performance <sup>3</sup>	2.8 (1.9)	3.7 (1.4)*	0.024	3.2 (1.7)	0.299

<sup>1</sup> Possible score between 1 (not at all) and 6 (everyday).

<sup>2</sup> Possible score between 0 and 16, a higher score means more difficulties.

<sup>3</sup> Possible score between 0 and 6, a higher score means greater cognitive impairment.

<sup>4</sup> Chi-square statistics were used to test difference in relationship category by setting.

SOURCE: Lum, T.Y., Kane, R.A., Cutler, L.J., and Yu, T-C., University of Minnesota, 2008.

**Table 3**  
**Differences in Family Assistance, Family Satisfaction, Family Experience and Global Satisfaction**  
**Across Green House (GH®), Cedars, and Trinity at Baseline Interview**

	GH®	Cedar	p-value	Trinity	p-value
	Mean (SD)	Mean (SD)		Mean (SD)	
<b>Family Assistance<sup>1</sup></b>					
Outside Activity	1.9 (1.4)	1.5 (1.1)	0.123	1.6 (0.9)	0.218
Shopping for Errands	3.2 (1.3)	2.6 (1.4)	0.088	2.9 (1.4)	0.319
Arranging Health Care	1.4 (0.5)	1.4 (0.8)	0.948	1.5 (0.8)	0.543
Financial Management	3.2 (1.8)	2.9 (1.9)	0.471	3.1 (1.6)	0.785
Laundry	2.4 (1.6)	2.6 (2.0)	0.632	1.6 (1.2)*	0.021
Get from Place to Place	3.3 (1.7)	2.9 (1.7)	0.294	2.7 (1.4)	0.078
Grooming or Dressing	2.4 (1.6)	2.6 (1.7)	0.564	2.3 (1.6)	0.765
Toilet	1.6 (1.4)	1.5 (1.3)	0.835	1.3 (0.7)	0.164
Involved in Life of the NH	1.7 (1.3)	1.2 (0.8)	0.056	1.9 (1.2)	0.572
Overall Family Involvement	21.2 (6.9)	19.3 (7.6)	0.271	18.9 (6.0)	0.118
<b>Family Satisfaction<sup>2</sup></b>					
General Amenities, Meals and Housekeeping	19.5 (3.9)	20.2 (3.4)	0.389	20.8 (3.3)	0.117
Social Environment	15.9 (3.7)	15.7 (2.5)	0.75	17.7 (2.1)*	0.016
Physical Environment and Privacy	10.6 (3.4)	10.7 (2.6)	0.861	12.6 (2.2)**	0.003
Autonomy	24.2 (4.4)	24.2 (4.6)	0.941	26.7 (3.9)*	0.015
Health Care	22.0 (5.7)	21.7 (4.4)	0.815	24.8 (3.6)	0.054
<b>Family Experience<sup>3</sup></b>					
Family Burden	30.2 (5.3)	30.7 (4.9)	0.666	33.3 (3.2)**	0.002
Objective Burden	25.6 (6.6)	25.2 (5.7)	0.818	25.3 (7.3)	0.841
Subjective burden	25.2 (6.1)	26.8 (6.7)	0.319	26.0 (8.3)	0.602
<b>Global Satisfaction<sup>4</sup></b>					
With NH as Place to Live	3.5 (0.7)	3.6 (0.6)	0.519	3.9 (0.3)***	0
With NN as Place for Care	3.5 (0.6)	3.6 (0.5)	0.907	3.9 (0.4)***	0.006
Likelihood to Recommend	3.7 (0.7)	3.6 (0.6)	0.667	3.9 (0.3)*	0.033

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

<sup>1</sup> Each family help item is measured on a 6-point scale. Overall family help is the sum of the nine items with a higher score meaning more family help.

<sup>2</sup> The number of items for the domain scales were: General Amenities (four items), Social Environment (four items), Physical Environment (three items), Autonomy (six items), and Health Care (five items). Each item is rated on a 5-point scale and a higher score means a more positive rating.

<sup>3</sup> The Family Experience ratings use seven items, each rated on a 5-point scale from worst to best. The summative scale range is 7 to 35 with a higher score meaning a higher experience.

<sup>4</sup> Each family member rated the nursing home as a place to live, and as a place to give care, and also indicated how likely they would be to recommend the facility to someone else. Each item was measured on a 4-point scale.

NOTE: NH is nursing home. SD is standard deviation.

SOURCE: Lum, T.Y., Kane, R.A., Cutler, L.J., and Yu, T-C., University of Minnesota, 2008.

cognitive problems and behavior disturbances also tended to be admitted to the dementia GH®s, Cedars had a high complement of residents with advanced dementia who were not in the SCU.

Table 3 shows the differences in family assistance, family satisfaction with resident care, family experience, family burden, and

global satisfaction scores across the sample that later went to the GH®, the sample that remained at Cedars, and the sample from Trinity at the baseline interview. There was no statistically significant difference between GH® and Cedars in any of these outcome measures in the baselines. However, there were eight statistically

significant differences between GH<sup>®</sup> and Trinity: GH<sup>®</sup> family members were more involved in assisting residents with laundry than Trinity family members. Trinity family members were more satisfied with (1) the social environment, (2) physical environment and privacy, and (3) autonomy than GH<sup>®</sup> family members, and reported a better family experience and higher global satisfactions in all three global satisfaction measures. Also, there was no statistically

significant difference in objective and subjective family burden.

### Effects on Family Involvement

Table 4 shows the results of random-effects Tobit regressions (Maddala, 1987) on family involvement variables. There were two statistically significant differences between Cedars and GH<sup>®</sup> family members in family involvement: GH<sup>®</sup> family

**Table 4**  
**Results of Regression Analyses on Family Assistance, Family Satisfaction, Family Experience, and Global Satisfaction in Wave 2 to 4**

	Cedars		Trinity	
	Coefficient (S.E.)	z-Value	Coefficient (S.E.)	z-Value
<b>Family Assistance<sup>1</sup></b>				
Outside Activity	-0.04 (0.32)	-0.12	-0.28 (0.37)	-0.74
Shopping for Errands	0.15 (0.20)	0.76	0.49 (0.23)*	2.10
Arranging Health Care	0.11 (0.35)	0.31	0.81 (0.39)*	2.09
Financial Management	0.60 (0.38)	1.57	0.99 (0.44)*	2.23
Laundry	3.10 (0.69)***	4.53	2.02 (0.79)*	2.55
Get from Place to Place	0.18 (0.35)	0.52	0.31 (0.41)	0.76
Grooming or Dressing	0.13 (0.56)	0.23	-0.58 (0.64)	-0.90
Toilet	0.53 (0.91)	0.58	-0.25 (1.06)	-0.23
Helps with Nursing Home Program	0.38 (0.41)	0.36	0.28 (0.47)	0.56
Overall Family Assistance	2.13 (1.07)*	2.00	1.52 (1.22)	1.24
<b>Family Satisfaction<sup>1</sup></b>				
General Amenities, Meals, and Housekeeping	-5.03 (1.10)***	-4.58	-2.39 (1.25)	-1.92
Social Environment	-0.79 (0.61)	-1.29	0.66 (0.72)	0.92
Physical Environment and Privacy	-5.22 (0.57)***	-9.15	-2.95 (0.65)***	-4.54
Autonomy	-3.78 (0.92)***	-4.08	-3.38 (1.09)**	-3.09
Health Care	-6.67 (1.12)***	-5.98	-2.92 (1.27)*	-2.30
Family Experience	-4.43 (1.06)***	-4.19	-1.83 (1.22)	-1.49
<b>Family Burden<sup>1</sup></b>				
Objective Burden	1.65 (1.06)	1.57	1.78 (1.22)	1.46
Subjective Burden	1.56 (1.13)	1.38	0.45 (1.33)	0.34
<b>Global Ratings<sup>1</sup></b>				
Place to Live	-1.74 (0.45)***	-3.83	-0.50 (0.49)	-1.02
Place to Get Care	-1.50 (0.42)***	-3.53	-0.54 (0.47)	-1.14
Recommend	-2.38 (0.64)***	-3.71	-0.80 (0.68)	-1.17

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

<sup>1</sup> The analysis was done with (1) random-effects Tobit (Maddala, G.S.: Limited Dependent Variable Models Using Panel Data. *The Journal of Human Resources* 22(3): 307-338, 1987) or (2) random-effects ordered probit (Frechette, G.: Random-Effects Ordered Probit. *STATA Technical Bulletin*: StataCorp LP, 2001) regression using the Green House<sup>®</sup> residents as the reference group. Analyses are controlled for wave of data collection, sex of family member, activities of daily living of residents, cognitive performance of resident, sex of resident, and relationship between family member and resident.

SOURCE: Lum, T.Y., Kane, R.A., Cutler, L.J., and Yu, T.-C., University of Minnesota, 2008.

members were less involved in helping laundry for the residents than Cedar family members, and GH<sup>®</sup> families had a lower overall family assistance score than Cedars family members. Compared with Trinity family members, GH<sup>®</sup> family members were less involved in some specific tasks, such as shopping for errands, arranging health care, financial management, and laundry. However, there was no statistically significant difference between GH<sup>®</sup> and Trinity in the overall family involvement score.

### Effects on Family Outcomes

Table 4 also shows the results of random-effects Tobit regressions (Maddala, 1987) on family satisfaction variables and random-effects ordered Probit regressions on global satisfaction ratings (Frechette, 2001). Compared with Cedars family members, GH<sup>®</sup> family members reported higher satisfaction in 4 out of the 5 satisfaction subscales: general amenities, meals, and housekeeping; physical environment and privacy; autonomy; and health care. GH<sup>®</sup> family members also reported higher satisfaction in 3 out of the 5 satisfaction subscales than Trinity family members: physical environment and privacy, autonomy, and health care. Compared with Cedars family members, GH<sup>®</sup> family members reported higher global satisfactions on all three global rating items. There was no statistically significant difference between GH<sup>®</sup> and Trinity family members in these global satisfaction ratings.

### Qualitative Observations

At baseline, the 37 family members whose relatives were going to move to the GH<sup>®</sup> has some awareness of the concept of GH<sup>®</sup>, and all but 2 offered some discussion of what they thought a GH<sup>®</sup> would

offer. Twenty-seven elaborated on the idea that the GH<sup>®</sup> would be a home rather than an institution. Typical responses: “It will seem more like home for him;” “It’s a home-type atmosphere away from institutional effects,” or “It’s as close to home as we will ever get.” One spouse who visited his wife daily at Cedars said at baseline: “We are looking forward to going to a home setting. Nobody wants to live in this setting, especially at this age, so we are looking forward to going to our home.” Eight respondents commented on the small scale and the advantages of private rooms and bathrooms. Ten family members elaborated on their understanding of an improved staff model—some said that staff would be more consistently assigned, or be more attentive. A few of those comments had elements of worry—one respondent was concerned about “...only 2 people in charge of the whole house.”

Table 5 categorizes responses of GH<sup>®</sup> families to selected qualitative questions at each followup time period. At 6 months, family members tended to be enthusiastic in their open-ended responses. Asked what they liked best, many said “Everything!,” but went on to specify positive aspects. The most common praise was the setting and program is like home, or it is home, and/or it is not institutional and like a nursing home. Many liked the individualized approach and kind, living attitudes of the CNAs, and many appreciated that a small core of permanent staff served the GH<sup>®</sup> so that they got to know the residents, and family members could also get to know the staff. Other things liked best included the private rooms, and the greater empowerment or freedom of the residents. Some family members mentioned that they personally liked to visit, and that they themselves could help their resident or help in the kitchen if they wanted to do so. These positive elements remained salient at 12

**Table 5**  
**Qualitative Findings from Interviews of Family Members of Green House (GH®) Residents**

Item	6-Month Followup	12-Month Followup	18-Month Followup
<b>Likes Best about the GH®<sup>1</sup></b>		Percent	
Homelike, Not an Institution	45	29	31
Staff Friendly, Caring, Responsive, Close-Knit Family	24	18	19
Good Care	21	34	33
Room to Self, Bring Own Things, Privacy	18	18	25
1-1 Staff Attention, Consistent Staff	11	2	1
Visiting is Pleasant, Family Welcome	8	5	1
Resident Can Make Decisions, Has Control, Feels Useful, Sets Routines	8	13	1
Likes Overall Layout and Design	8	7	1
Food	1	—	1
Family Feels Confident and Secure about the Care	—	—	1
Resident is Happy	—	11	3
<b>Likes Least about the GH<sup>1</sup></b>			
Can't Think of Anything, No Least, Like it All	47	69	58
Not Enough Line Staff in House, Line Staff too Isolated, Other Concerns Regarding Line Staff	21	5	5
No Nurse in Building, Nursing Care	11	2	—
Not Enough Organized Activity	11	5	1
Not Enough Parking	2	2	1
Other Specific Complaint <sup>2</sup>	8	14	14 <sup>2</sup>
Communication with Family	—	5	—

<sup>1</sup> Percentages add to more than 100 percent because every component of answer was coded for each respondent.

<sup>2</sup> At 6 months, one respondent mentioned each of the following: relative could not get bananas; relative needs covered outdoor space to smoke; housekeeping in room not up to her standard; temperature too cold; and relative needs to be outside more; at 12 months, one respondent mentioned each of the following: irregular doctor's visits; clothes not put away in organized fashion; no storage area; she is cold; and parking for ambulance is inadequate; at 18 months 1 respondent mentioned each of the following: the temperature is too cold; lack of public bathroom; doctors do not come enough; there should be a dietician; and father is only male in building.

SOURCE: Lum, T.Y., Kane, R.A., Cutler, L.J., and Yu, T-C., University of Minnesota, 2008.

and 18 months, though at those later dates a larger proportion mentioned good care, their own sense of confidence and security, and that the resident was happy. At all time intervals, substantial proportions of family members could cite nothing they disliked about the new model. Some felt that two CNAs were not enough to handle things if there were an emergency, even though many recognized that the ratio of CNAs and registered nurses to residents was higher than it had been at Cedars. Similarly a common concern was that no nurse was located at all times in the building; some acknowledged they knew a nurse was in close range, but liked the thought that a nurse was in the building.

By the last wave of data collection, these concerns had diminished in importance. Concerns about lack of activities, including religious activities, remained for some family members at the 18-month interval, but for the most part the thing liked least was something very specific to that family member and resident, or nothing at all.

During field observations, we noted many family members who almost became fixtures at the GH®s. In one GH®, a spouse of a severely physically disabled resident with a degenerative disease attended almost every evening meal and added to the life of the GH®. Family members were often observed taking refreshments with their resident relatives or staff members.

At the two houses for dementia, visits from family tended to occur in the shared spaces, whereas in the other two GH<sup>®</sup>s, visitors largely sought the privacy of residents' rooms except for the shared meals. We observed many instances of cordial rapport among elder assistants, residents, and family. We learned of one example where staff had difficulty managing what they saw as excessive involvement from family (a much younger wife with nursing background becoming heavily involved in direct care, a grandson too frequently staying overnight, and relatives too frequently staying for meals and bringing food home). Perhaps these problems could have been more effectively resolved with more skill from the elder assistants and greater coaching from social work. The progenitors of the model hoped that relatives would stay for meals and sometimes stay overnight, but this example was perceived as bordering on exploitative. All other examples and anecdotes that we have amassed regarding families in the GH<sup>®</sup> during the period of study are positive. A full description of qualitative findings, gleaned from detailed, longitudinal post-occupancy evaluation studies (Cutler and Kane, in press) and from open-ended questions included in questionnaires is beyond the scope of this article.

## DISCUSSION

### Summary

Family members of residents who went to the GH<sup>®</sup>s were more engaged overall in the residents' care than families of residents remaining in Cedars, despite that family members at the GH<sup>®</sup>s gave less help with laundry than at the other settings. Qualitative interviews showed that family members who had previously done their resident's laundry due to loss or ruining

of garments were pleased to have the laundry done by resident assistants given that the personal laundry was done locally, in resident-specific batches, and carefully.

The GH<sup>®</sup>s had significantly better outcomes than Cedars in four of the five family satisfaction domains, in family experience, and in all global satisfaction items. Compared to Trinity, which had better baseline family measures than Cedars, the GH<sup>®</sup> families rated the facility higher on three of the five satisfaction domains, with the greater differences being found for privacy and the physical environment and autonomy, two areas the GH<sup>®</sup> especially was meant to impact. The GH<sup>®</sup> was also more positive than Trinity on the general amenities, meals, and housekeeping domain and on the family experience scale, but these differences were not statistically significant. The changed family experience at the GH<sup>®</sup> was not associated with any increased family perceptions of burden. In summary, the GH<sup>®</sup> achieved much better results for family members than Cedars, the sponsoring nursing home, and also achieved some more positive results compared to Trinity, a facility that exhibited high satisfaction at baseline.

The study has some limitations. First, it relied on information from and about a single family member. In fact, we noted in the observational parts of our study that multiple family members were involved with a single resident, including some who had not visited previously because they found the nursing homes depressing; but our study could pick up only the contacts with and reactions of the family member deemed primary informal caregiver. Also, this study was conducted during a time when enormous national attention was lavished on the GH<sup>®</sup>s. Local and national visiting deputations were frequent, and GH<sup>®</sup> residents and their families appeared in a number of videos and

newspaper articles. This kind of attention had the potential to have an independent effect on the well-being of residents and the enthusiasm of families. We believe this Hawthorne (Landsberger, 1958) effect is not likely given that the positive reactions continued through the last time period, but even longer followups are necessary to see if the results are sustained. The numbers in the GH<sup>®</sup> were too small to permit us to do separate analyses of outcomes for family members present at all data collection waves or other subgroup analyses based on, for example, type of relationship of the family member to the resident.

## Implications

The GH<sup>®</sup> represented a dramatic change for family members in ways that might have challenged their prior views of a safe and appropriate nursing home experience which could have increased their anxieties for their residents. The positive results suggest that families are likely to be favorable to the kind of culture change represented by the GH<sup>®</sup>s. The improved scores in the satisfaction domains suggest that families appreciated increased autonomy for their residents, approved of the enhanced privacy and physical environments, perceived that general amenities including meals and housekeeping were better (compared to Cedars only), and that the changed power structure and the new CNA roles at the GH<sup>®</sup> led to a perception that health care services were also more available and responsive compared to both settings.

The only satisfaction domain that did not show improvement due to the GH<sup>®</sup> is the social environment subscale, comprised of items that included interesting things to do, availability of transportation to leave the facility, religious observances, and other residents having things in common with the family respondent's relative.

This provides some guidance to the GH<sup>®</sup>s as they move forward. In qualitative work on the implementation of the GH<sup>®</sup>, we noted that the elder assistants were not uniformly effective in implementing the aspect of their role that required that they organize individualized activities for GH<sup>®</sup> residents, and that they act to facilitate friendships among residents (Kane and Cutler, 2008). The elder assistants had a great many elements of the model to implement simultaneously including the application of culinary skills and working within house-specific self-directed work teams. They had a great deal of additional training for their new responsibilities, but, in retrospect, they received insufficient training and reinforcement on communication and social well-being. In the postoccupancy evaluation, we noted that no particular efforts were made to conduct religious services on Sundays or to facilitate residents to attend outside churches or services at the main facility—a surprising omission in a population that tended to be religious (Cutler and Kane, in press).

The GH<sup>®</sup> model already proved measurably effective for resident quality of life and satisfaction (Kane et al., 2007). This study shows its effectiveness for family members, who are consumers in their own right, and who affect resident well-being if the model enhances family relationships and encourages family engagement with residents. For GH<sup>®</sup>s and the more generic small-house nursing homes (Rabig and Rabig, 2008) to be maximally successful in improving resident psychological and social well-being, the roles of leaders most responsible for psychosocial well-being need to be adapted to the small-house models.

As stated at the outset, family members are important arbiters of whether changes in nursing home life will prove acceptable, and they in turn, by their presence and support, contribute to the quality of life for

residents. These findings provide some clues to the concerns family members have initially about a dramatically changed staffing patterns and a more normalized lifestyle. Social services staff and other staff could have a role in identifying these concerns, alleviating any misapprehensions, and acting on those issues that have validity. Family members are the eyes and ears of the facility, and can identify issues, for example, in housekeeping, or in some staff attitudes, that are problematic.

In this particular experiment, the implementation of GH<sup>®</sup> focused intensively on developing protocols for the new buildings, the cooking, the new reporting arrangements, and the broadened role of CNAs. The social services and activities directors, and for that matter, the director of nurses, were not heavily involved in getting the four GH<sup>®</sup>s launched. However, it is clear that the roles for social services would and should change and expand under this model, and that the roles for activities personnel would also need to change. Social workers could have an important role in training and assisting elder assistants to work out individualized life plans on behalf of residents, and could show staff how to enhance communication skills with residents and family members. The GH<sup>®</sup>s relieve social workers of the frustrations of working with roommate incompatibilities, but the social worker could enhance the way new residents fit into a GH<sup>®</sup> group, and at times may need to negotiate changes of venue. (In this study, one family member liked least that her relative was the only male in the GH<sup>®</sup>.)

Activities personnel especially need to adapt their roles to facilitate social well-being through individual and group activities. The elder assistants, with advice and support from activities professionals, could be expected to facilitate meaningful solo and group activities within the GH<sup>®</sup>

settings. However, participation in outside activities will depend on the efforts of activities personnel and volunteers because elder assistants are necessarily tied to their assigned GH<sup>®</sup>s by the demands of caring for any individuals who are ill or unable to leave and by cooking responsibilities. We expect creative models for activity directors to emerge with new iterations of the GH<sup>®</sup>s. Since we completed this study, Cedars nursing home has opened six more GH<sup>®</sup>s, and now has only 28 licensed beds in the parent facility, which at this time are being used as an admissions unit and for a newly certified Medicare-funded rehabilitation program. With GH<sup>®</sup>s dominating the provision of services, the need for retailoring roles for social workers, activities personnel, and chaplains becomes even more imperative.

The literature reviewed at the outset suggested that families sometimes find nursing home visits awkward and depressing. The pleasantness and normality of residents' private spaces and the shared indoor and outdoor spaces in the GH<sup>®</sup> helps alleviate that problem. It is possible that some of the difficulties in interactions stems from the fact that family members see their relatives as residing in a hospital-like milieu, preoccupied with their health, and removed from everyday life and interests. The small-house model studied here has potential to engage residents in mainstream activities and interests that can be shared with family members of all ages. Future studies should explore that dynamic and the ways that psychosocial staff can work to increase the natural nature of the settings.

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