Predicting the Health-Related Values and Preferences of Geriatric Patients

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Background. Those who must make health care decisions on behalf of persons who lack decision-making capacity often have too little information. The purpose of this study was to determine whether and to what degree sociodemographic factors, social support, religious involvement, and functional status served as predictors of the health-related values and preferences of geriatric patients.

Methods. A retrospective chart review involving 178 cognitively intact patients enrolled at a geriatric clinic at a university medical center was conducted. Patient variables included age, race, sex, marital status, years of education, participation in formal religious activities, self-reported functional status, and adequacy of social and family support. These were compared with responses to a modified version of the Values History questionnaire, an established method of evaluating patient values that includes advance directives.

Results. Patients were likely to value quality (82%) over quantity of life (18%) and the ability to think clearly (64%) over 13 other specific health-related values. They were likely (93%) to want to be taken to a hospital emergency department on losing consciousness or becoming confused. Seventy-eight percent expressed a desire to be resuscitated using cardiopulmonary resuscitation (CPR), and 76% expressed a preference for use of a respirator, if necessary. Most (85%) considered a permanent vegetative state to be worse than death. High functional status predicted a preference for quality of life over length of life and the perception of a persistent vegetative state as worse than death (positive predictive value = 89%). Persons with better social and family support were more likely to accept treatment with CPR or a respirator and less likely to consider a permanent vegetative state to be worse than death. No single patient factor was strong enough to increase the probability of a particular value or preference by more than 17% above baseline.

Conclusions. Sociodemographic and functional status variables are relatively weak predictors of personal values and directives. This reinforces the importance of routinely eliciting patient values and preferences and of updating the information, particularly following changes in functional status or family support. Baseline information regarding the health-related values and preferences of this primary care geriatric clinic population may provide valuable information about the values and preferences of decisionally impaired older patients.

Key words. Geriatrics; bioethics; advance directives; social values; decision making. (*J Fam Pract 1994; 39:461-467*)

There is now general agreement that physicians have a responsibility to attempt to understand and document their patients' values and preferences regarding future medical interventions (advance directives).[1-7] Nevertheless, for a variety of reasons, many persons lose their decision-making capacity without having provided useful information on which their families and health care providers can base medical decisions. Surrogate decision-makers must then attempt to decide what that person would have wanted in the way of medical interventions under the circumstances. In the absence of specific information, family members and physicians are often inaccurate in their predictions about such matters.[8-10] In these cases, it would be useful to know the preferences of other

Submitted, revised, July 25, 1994.

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ISSN 0094-3509

people of similar age, sociodemographic background, and functional status. In addition, it would be useful to know if there are any patient characteristics that predict values and preferences regarding medical interventions. Based on these premises, we have analyzed the responses of a panel of older patients seen in a primary care geriatric clinic to the questions contained in a modified version of the Values History by Doukas and McCullough,[11,12] and have attempted to determine sociodemographic, social support, and functional status characteristics that might predict particular values and preferences.

Methods

The Geriatric Continuity Clinic (GCC) is a primary care clinic created in 1989 for patients who either are over the age of 65 or have significant functional impairment and might therefore benefit from a geriatric approach. The clinic is located in the outpatient department of a free-standing rehabilitation hospital, which is part of the University of Oklahoma Health Sciences Center in Oklahoma City. The two physicians involved in the clinic during the study period were faculty in the Department of Family Medicine at that institution.

All patients enrolled in the GCC must complete a lengthy questionnaire that includes several standard geriatric assessment instruments as well as questions about medical history. The questionnaire also includes the Values History, an instrument developed by Doukas and McCullough[11,12] (modified to include a question regarding conditions considered worse than death), which documents certain patient values and advance directives. The Values History solicits patient responses to questions about treatment preferences based on the person's current health status. That is, the question asked is "If your heart were to stop this very minute here in my office, would you want me to try to restart it using cardiopulmonary resuscitation (CPR)?" rather than, for example, "If you were in a persistent coma, would you want . . . ? "The entire questionnaire is reviewed with the patient by both a nurse and a physician, and any patient questions are addressed. At the time of the first clinic visit, all patients are given the Short Blessed Mental Status Test.[13] Some patients are also given the Folstein Mini-Mental State Examination[14] or the Neurobehavioral Cognitive Status Examination,[15] depending on whether there are specific clinical concerns about cognition. A complete history and physical examination are repeated annually, at which time all this information is reviewed and updated if necessary.

The records of all patients (N=260) enrolled in the GCC over a 3-year period between May 1989 and May 1992 were abstracted. Seventy-five subjects who had scored above 8 on the Blessed test, below 24 on the Folstein test, or who had demonstrated impaired judgment or greater than mild short-term memory impairment on the Neurobehavioral Cognitive Status test were excluded from the analysis. An additional seven patients were excluded for failure to complete most of the Values History portion of the questionnaire (defined as at least 11 of the 13 questions).

The following information was abstracted from the records of 178 patients and codified: age, sex, race, marital status, years of formal education, frequency of participation in formal religious activities (times per month), total score on the Lubben Social Network Scale[16] (maximum score: 50), scores for activities of daily living ([ADL] ie, eating, dressing, grooming, walking, ability to transfer from one position to another, bathing, and toileting), and instrumental activities of daily living ([IADL] ie, use of the telephone, traveling to places out of walking distance, grocery shopping, meal preparation, housework, taking medication, handling money). Each question on the ADL and IADL instruments has a value of 0 (complete dependence), 1 (needs some assistance), or 2 (complete independence). The maximum total score on each is 14.

Items abstracted from the Values History included preference for quality or quantity of life; top three health-related values chosen from a list of 14 options; willingness to undergo cardiopulmonary resuscitation, treatment with a respirator, or hospital emergency department care; prior execution of a living will or durable power of attorney; willingness to donate organs or have an autopsy performed after death; and permanent conditions considered worse than death (chosen from a list of six options).

Stepwise logistic regression[17] was used to select those characteristics (age, sex, etc) that were significant predictors ($P<.05$) of the responses to the Values History questions. As is typically done when using stepwise procedures, only the subjects that had complete data for all potential predictors were included in the variable selection process. Once the selection process was completed, the logistic regression model based on the selected predictor(s) was estimated using all subjects with complete data for those predictor(s). The goodness-of-fit of the resulting logistic models was assessed using the score test.[17] The Statistical Analysis System (SAS Institute, Cary, NC) was used to perform all calculations for this study.

So that clinicians might more easily apply the logistic regression model in a clinical setting, individual predictors were viewed as diagnostic tests, each with its own sensitivity, specificity, and predictive value. For each continuous predictor variable, a breakpoint was determined. For

values above the breakpoint, the result of the test was considered to be positive, and for those below it, the test result was considered negative. Breakpoints were chosen to maximize the area under the receiver operating characteristic (ROC) curve,[18] which results in the best possible balance between the sensitivity and specificity of the test as a predictor of a positive response to the corresponding Values History question.

For example, it was determined by using stepwise logistic regression that the Lubben scale score is a significant predictor of whether a patient would want CPR ($P=.003$). A breakpoint of 24.8 on the Lubben scale maximizes the area under the ROC curve, so that all patients with a Lubben scale score greater than 24.8 would be considered positive for wanting CPR, whereas all patients with a Lubben scale score less than 24.8 would be considered negative. By using each subject's actual response to the CPR question as the gold standard, one can determine the accuracy of these judgments for all patients in the study and calculate the predictive values.

Results

Most of the patients studied were white (78%) and female (75%). Their average age was 76 years. Forty percent had more than a high school education. On average, they were functioning at a fairly high level (mean ADL score, 12.6 of 14; mean IADL score, 11.8 of 14). The ranges for education, religious involvement, social support, and functional status were wide (Table 1).

The two most frequently chosen of the 14 value statements were: "I want to maintain my capacity to think clearly" (64%) and "I do not want to be an unnecessary burden on my family" (45%) (Figure 1). A minority of patients considered "unable to live by myself" (6%), "living in a nursing home" (15%), or "unable to make decisions" (21%) to be worse than death (Figure 2). For Values History questions for which significant ($P<.05$) predictors were found, the percentage of subjects in the study population that responded favorably to the question can be found in the "Baseline Probability" column of Tables 2, 3, and 4.

Only 28% of the patients had a living will, and only 11% had executed a durable power of attorney at the time of enrollment in the clinic. However, 82% listed a specific person, usually a close family member, whom they authorized to be their informal surrogate decision-maker.

Predictors of Values History responses as determined by stepwise logistic regression analysis are presented in Tables 2 through 4. Only the predictors that were significant at the .05 level according to the test score [17] were retained. The plus and minus signs in the table indicate the direction of the relationship between the predictor and the probability of positive responses to the Values History questions. For example, in Table 2, patients with *higher* levels of religious involvement were more likely than their peers to say that they wanted to choose treatment in accordance with religious beliefs and traditions as one of their three most important values (17% vs 7%), whereas those with *lower* ADL scores were more likely to choose treatment with dignity when no longer able to speak for themselves (35% vs 28%).

Calculated breakpoints for each predictor are shown in Tables 2 through 4 in the "Predictor" column. For example, Table 3 illustrates that subjects younger than 78.2 years of age (the breakpoint for this predictor of this preference) are likely to want emergency department

Table 1. Characteristics of Cognitively Intact Geriatric Patients (N=178), by Chart Review

Characteristic	Finding
Age, y	
Mean (range)	76.1 (56–94)
Standard deviation	7.6
Female, %	75
Race, %	
White	78
Black	19
Native American	2
Other	1
Marital status, %	
Married	44
Divorced	40
Widowed	11
Separated	3
Single	2
Education, %	
<9 years	19
9–12 years	41
>12 years	40
Religious involvement*	
Mean (range)	3.9 (0–20)
Standard deviation	4.4
Lubben Social Network Scale score (maximum, 50 points)	
Mean (range)	26.0 (0–47)
Standard deviation	8.6
Activities of daily living score, (maximum, 14 points)	
Mean (range)	12.6 (5–14)
Standard deviation	2.2
Instrumental activities of daily living score (maximum, 14 points)	
Mean (range)	11.8 (1–14)
Standard deviation	3.0

**Number of times per month subject participated in formal religious activities.*

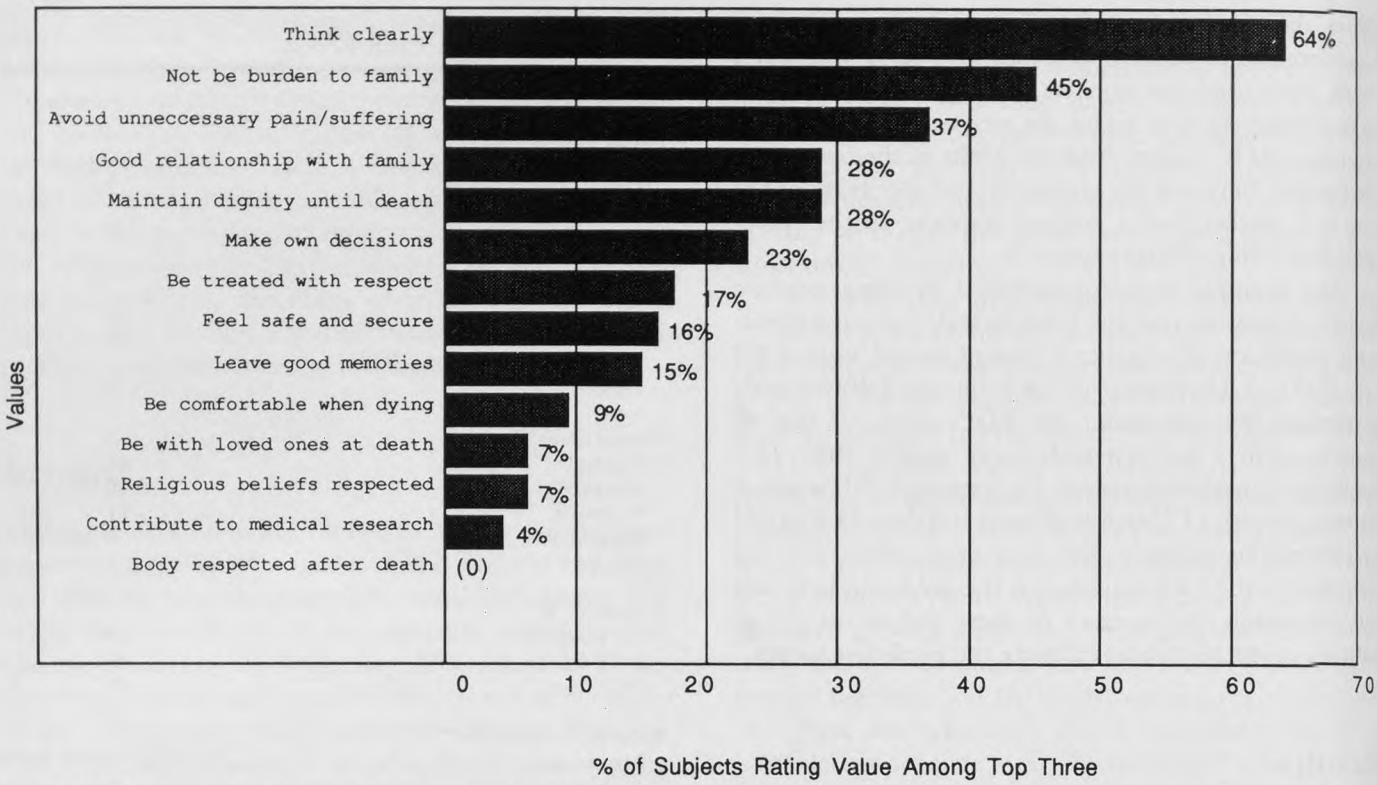

Figure 1. Values rated as most important by cognitively intact geriatric patients (n=164). Note that not all subjects completed this item on the Values History.

treatment for sudden loss of consciousness. In this example, the positive predictive value (ie, the probability that they would want this treatment, given that their age is less than 78.2 years) is 95%. The negative predictive value (that is, the probability that a subject who is 78.2 years of age or older would not want to be taken to the emergency department) is only 10%.

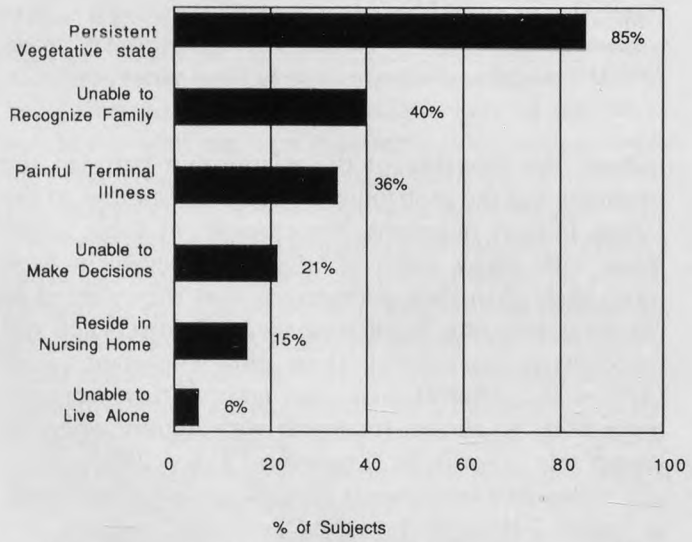

Figure 2. Permanent conditions considered worse than death by cognitively intact geriatric patients (n=177). All but one subject in the study responded to this question.

Discussion

Of the many variables analyzed, relatively few were found to be strongly predictive of specific values and directives. Even for the predictors that were significant at the .05 level, the area under the ROC curve is below .80, which is considered to be the cutoff for models of practical interest.[18] This reinforces the importance of discussing personal values and preferences with every adult patient. However, when no information is available regarding the preferences of patients incapable of decision-making, the results of this research may be useful.

Many of the findings were expected. The known preference of many older people for quality of life over quantity of life has contributed to an emphasis in clinical geriatrics on functional assessment and other measures of quality of life. It was also not surprising to us that the ability to think clearly and the desire not to be a burden on their families were among the top three health-related values for many of our patients.

The relatively high percentage of patients who chose to undergo CPR if they were to experience a cardiac arrest is

Table 2. Significant Predictors of Values Regarding Medical Interventions Among Cognitively Intact Geriatric Patients (N=178)

Value	Predictor*	A(Z)†	Baseline Probability,‡ %	Positive Predictive Value, %	Negative Predictive Value, %
Quality of life over length of life	IADL (+) >11.5 (of possible 14)	.604	82	88	31
Be treated in accordance with religious beliefs	Religious involvement (+) >5.8 times/month	.773	7	17	95
Contribute to medical research and education	Religious involvement (+) >5.9 times/month	.652	4	10	98
Feel safe and secure	Family/social support (−) <25.1 (of possible 50)	.629	16	22	89
Be treated with respect	Marital status (divorced/separated) (+)	.625	17	25	89
Maintain good relationship with family	Family/social support (+) >27 (of possible 50)	.598	28	34	77
Be treated with dignity until death even if unable to speak	ADL (−) <12.5 (of possible 14)	.552	28	35	75

**(+) and (−) indicate the direction of the association.*
†Area under the ROC curve: 0.5 corresponds to no predictive accuracy and 1.0 corresponds to perfect accuracy.
‡Percentage of all subjects choosing this value among their top three values.
IADL denotes instrumental activities of daily living; ADL, activities of daily living.

consistent with data from other studies of similar populations.[19,20] Low utilization of living wills and durable powers of attorney by the elderly have also been reported elsewhere.[21–23]

Another anticipated finding was that relative youth was predictive of greater preference for heroic lifesaving measures, such as emergency department treatment (95%), CPR (84%), or a respirator (84%). Even among those older than aged 78, however, more than two thirds still wanted these measures to be used if necessary (negative predictive values, 10%, 31%, and 33%, respectively).

Some findings were unexpected. It is contrary to clinical experience that 50% of our patients expressed a willingness to have an autopsy performed after death; family members often say, "She would not have wanted to be put through something like that." Although 85% considered a persistent vegetative state to be worse than death, we were somewhat surprised that 15% of our patients *would* want to be kept alive under those circumstances. Pearlman et al[24] have provided some insight into valuations by patients of states worse than death. It is clear from their work that people weigh a variety of factors when reaching conclusions

Table 3. Significant Predictors of Preferences Regarding Medical Interventions Among Cognitively Intact Geriatric Patients (N=178)

Medical Interventions	Predictor*	A(Z)†	Baseline Probability,‡ %	Positive Predictive Value, %	Negative Predictive Value, %
Life-prolonging procedures					
Hospital emergency department treatment	Age (−) <78.2 years	.696	93	95	10
Cardiopulmonary resuscitation	Age (−) <77.3 years	.662	78	84	31
	Family/social support (+) >24.8 (of possible 50)	.661	78	85	32
Respirator	Family/social support (+) >24.8 (of possible 50)	.661	76	84	36
	Age (−) <77.3 years	.651	76	82	33
Postmortem procedures					
Organ donation	Education (+) >12.5 years	.687	33	50	79
Autopsy	Family/social support (+) >26.2 (of possible 50)	.613	50	60	61

**(+) and (−) indicate the direction of the association.*
†Area under the ROC curve: 0.5 corresponds to no predictive accuracy and 1.0 corresponds to perfect accuracy.
‡Percentage of all subjects with this preference.

Table 4. Significant Predictors of Beliefs Regarding the Value of Life Under Certain Circumstances and of Completion of Legal Advance Directive Documents Among Cognitively Intact Geriatric Patients (N=178)

Variables	Predictor*	A(Z)†	Baseline Probability,‡ %	Positive Predictive Value, %	Negative Predictive Value, %
Conditions considered worse than death					
Unable to make decisions for self	Family/social support (−) <24.5 (of possible 50)	.689	21‡	32	87
Permanent vegetative state	IADL (+) >11.2 (of possible 14)	.658	85‡	89	25
	Family/social support (−) <24.5 (of possible 50)	.619	85‡	88	18
Unable to recognize family	Education (+) >12.2 years	.631	40‡	51	66
Legal documents					
Durable power of attorney	Education (+) >13.1 years	.684	11§	17	93
	Age (+) >77.7 years	.685	11§	18	95
Living will	Age (+) >76.8 years	.612	28§	38	80
	ADL (+) >12.8 (of possible 14)	.629	28§	33	83

**(+) and (−) indicate the direction of the association.*
†Area under the ROC curve: 0.5 corresponds to no predictive accuracy and 1.0 corresponds to perfect accuracy.
‡Percentage of all subjects with this opinion.
§Percentage of all subjects who had completed document.
IADL denotes instrumental activities of daily living; ADL, activities of daily living.

about these matters. If an older patient is in a persistent vegetative state, the presumption should be (based upon our data) that that person would not want to be kept alive unless information were available to suggest that his or her values and preferences regarding such matters were different from those of the majority. This presumption would be strengthened if the person's IADL score prior to infirmity was greater than 12 (positive predictive value = 89%) or his or her Lubben score was less than 24 (positive predictive value = 88%; Table 4). This view is shared by Angell[25] and bolstered by public opinion polls.[26]

That family and social support was a predictor of preferences regarding the use of CPR and a respirator and the desire to be kept alive despite a persistent vegetative state may reflect the sense of security provided by having someone who could make difficult decisions on the patient's behalf, if necessary. Alternatively, it may reflect concern for the feelings of those who would be left behind.

That factors such as age, marital status, family and social support, and functional status, which are subject to change, are predictive of certain values and preferences is of great importance and some concern. It suggests that as these factors change over time, values and preferences also may change. This observation emphasizes the need to update values information regularly and whenever changes have occurred in these factors. It also highlights the need for longitudinal studies. Future research efforts should address this need.

Because the study was retrospective, missing data were problematic. Some of the Values History questions were more difficult to answer than others and therefore more frequently omitted. This reduced the power of the study to identify significant predictors. There is also concern regarding generalizability of the results to other groups of geriatric patients, which is a potential problem in studies carried out in a tertiary care setting. Because the GCC is a private faculty practice, it is probably more representative of an average family practice setting than are most university clinics. On the other hand, patients who choose to come to the GCC despite the paperwork and other barriers intrinsic to a university practice may be somewhat unusual in ways that have not yet been identified.

It has been well documented that the manner in which information regarding advance directives is presented to patients has an impact on their stated preferences.[27,28] Certainly, patients should be given as much information as they want, up to the limit of their ability to understand and deal with it. It is unclear how this can best be accomplished, particularly since the appropriate method may differ substantially from patient to patient. There was no standard method of instruction for patients in this study other than the information provided on the Values History. However, there were only two physicians and one nurse involved in the clinic during the time when these data were collected. It is possible, for example, that some patients who indicated that they wanted resuscitative measures such as CPR or respiratory therapy would have indicated otherwise had they been informed of the probabilities of success associated with these procedures.

We believe that despite the limitations of a paper-and-pencil tool for obtaining information about advance directives, the Values History is superior to most practical

alternatives. Whereas most investigators have found rates of documentation of advance directives discussion to be between 0% and 10% without an educational intervention,[9,29,30] and only about 15% with one,[31,32] we have been able to document advance directives and relevant values for 96% of our nondemented elderly patients. In many if not most cases, the Values History stimulates discussion between patients and physicians and sometimes between patients and their families. At the present time, we repeat the Values History on an annual basis with all our nondemented elderly patients. Based on the findings of this study, we will attempt to develop a method for more systematic reassessment following the development of significant changes in functional status or degree of family and social support.

Acknowledgments

We greatly appreciate the dedication and good work of Jan Wilmoth and Bonnie Lakes, without whom the manuscript could not have been completed.

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