

Advance Directives as Acts of Communication

A Randomized Controlled Trial

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Background: Instructional advance directives are widely advocated as a means of preserving patient self-determination at the end of life based on the assumption that they improve surrogates' understanding of patients' life-sustaining treatment wishes. However, no research has examined whether instructional directives are effective in improving the accuracy of surrogate decisions.

Participants and Methods: A total of 401 outpatients aged 65 years or older and their self-designated surrogate decision makers (62% spouses, 29% children) were randomized to 1 of 5 experimental conditions. In the control condition, surrogates predicted patients' preferences for 4 life-sustaining medical treatments in 9 illness scenarios without the benefit of a patient-completed advance directive. Accuracy in this condition was compared with that in 4 intervention conditions in which surrogates made predictions after reviewing either a scenario-based or a value-based directive completed by the patient and either discussing or not discussing the contents of the directive with

the patient. Perceived benefits of advance directive completion were also measured.

Results: None of the interventions produced significant improvements in the accuracy of surrogate substituted judgment in any illness scenario or for any medical treatment. Discussion interventions improved perceived surrogate understanding and comfort for patient-surrogate pairs in which the patient had not completed an advance directive prior to study participation.

Conclusions: Our results challenge current policy and law advocating instructional advance directives as a means of honoring specific patient wishes at the end of life. Future research should explore other methods of improving surrogate decision making and consider the value of other outcomes in evaluating the effectiveness of advance care planning.

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EVERY YEAR, many people in the United States complete advance directives (ADs) in the hope of ensuring that their wishes about medical treatment near the end of life will be honored. All 50 states and the District of Columbia have legislation that authorizes the use of instructional ADs (eg, living wills), the appointment of a health care agent, or both. These state laws are reinforced at the federal level by the Patient Self-determination Act.¹ The American Medical Association,² the American Geriatrics Society,³ the American Association of Retired Persons,⁴ and the Hastings Center⁵ all advocate the use of ADs as a crucial means of improving medical care at the end of life.

Policy- and law-advocating ADs flow directly from a belief in the ethical priority of self-determination in medical decision making.^{1,6,7} When illness or injury deprives individuals of decisional capacity, ADs are intended to preserve patients' ability to influence decisions about the medi-

cal care they receive.^{8,9} This is particularly true of instructional ADs, which are designed to communicate information about a patient's values, goals, and preferences to loved ones who are faced with the challenge of making decisions on the patient's behalf. Theoretically, instructional ADs maintain the patient's voice in treatment decisions by enhancing the ability of surrogate decision makers to make the treatment choices that patients would

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make for themselves if competent (ie, improve the accuracy of surrogate substituted judgment).

Studies have repeatedly found that without the benefit of an AD, both family members and physicians show substantial inaccuracy when attempting to predict patients' life-sustaining treatment preferences.¹⁰⁻¹⁷ No research, however, has tested the assumption that allowing surrogates to review or discuss a patient-

METHODS

PARTICIPANTS

ADVANCE participants were recruited from 6 primary care practices affiliated with Summa Health System in Akron, Ohio. Randomly selected patients aged 65 years and older (N=2544) received a letter from their physician inviting them to participate in the study. Individuals aged 75 years and older were oversampled. Potential participants were given 1 week after receipt of the letter to call the project office if they were unable or unwilling to participate (189 did so). Professional interviewers attempted to contact each remaining patient by telephone (612 potential participants could not be reached because of death, disconnected telephones, etc). The patients contacted (n=1704) were informed that the study involved three 1- to 2-hour in-home interviews over 2 years, additional interviews if hospitalized, and the coparticipation of a *surrogate decision maker* (defined as the individual they would want to make medical decisions for them if they were no longer able). Prior research²⁷ led us to anticipate that these study requirements would result in a participation rate of approximately 30%. Accordingly, age and sex information was obtained from all individuals contacted and an attempt was made to collect additional information about patients' plans for future medical care. A total of 447 potential participants were excluded for 1 or more of the following reasons: no available surrogate decision maker, spouse already participating, or patient judged unable to give informed consent. Of 849 refusing to participate, 510 agreed to answer questions about planning for future medical care. We randomized the remaining 408 patient-surrogate pairs to 1 of 5 experimental conditions using randomization without replacement within blocks of 5 pairs to ensure approximately equal sample sizes across conditions. Seven patient-surrogate pairs were dropped from the study after randomization (**Figure 1**).

OUTCOME MEASURES

The primary outcome (accuracy of substituted judgment) was measured with the Life-Support Preferences/Predictions Questionnaire (LSPQ).²⁸⁻³⁰ The LSPQ (written at the eighth-grade reading level)³¹ describes 9 different illness scenarios chosen to capture a wide range of conditions varying in their severity, nature of impairment, prognosis, and level of pain: (1) the patient's current health; (2) Alzheimer disease with moderately severe cognitive impairment; (3) emphysema with severe physical limitations; (4) coma persisting 6 weeks after a stroke with no obvious cognitive abilities and physician opinion of no chance of recovery; (5) the same coma scenario as item 4 with a physician opinion of a very slight chance of recovery; (6) stroke

resulting in partial paralysis, language deficits, total dependence in activities of daily living, and physician opinion of no chance of improvement; (7) the same stroke scenario as item 6 with a physician opinion of a very slight chance of improvement; (8) colon cancer with fatigue, no pain, and a life expectancy of 6 months; and (9) the same cancer scenario as item 8 with pain that requires the constant use of medication. Patients were asked to imagine themselves in each scenario and indicate their preference for receiving each of 4 life-sustaining medical treatments chosen to vary in invasiveness: (1) antibiotics for life-threatening pneumonia, (2) cardiopulmonary resuscitation (CPR) for cardiac arrest, (3) emergency gallbladder surgery for life-threatening gallbladder infection, and (4) artificial nutrition and hydration (ANH) for inability to take food or water. Preferences for ANH were not solicited in the current health scenario because patients were unlikely to require ANH in that situation. Patients indicated their treatment preferences using a 5-point Likert scale ranging from "definitely don't want" to "definitely want" treatment.^{10,11,13} Surrogates were asked to imagine the patient in each illness scenario and predict the patient's treatment preferences using the same scale.

The secondary outcomes (perceived benefits of AD completion) were measured with 5 questions using 5-point Likert scales. The questions measured patients' and surrogates' beliefs regarding (1) surrogates' general understanding of patients' life-sustaining treatment preferences, (2) confidence in surrogates' ability to predict accurately patients' treatment decisions, (3) surrogates' likelihood of honoring patients' treatment wishes, (4) surrogates' comfort in making medical decisions on behalf of the patient, and (5) the importance of having an AD.

PROTOCOL

Patients and surrogates were interviewed in a single session and institutionally approved informed consent was obtained from both participants.

In the no-AD (control) condition, patients and surrogates were separated after informed consent. Patients were administered the LSPQ and perceived benefit measures while surrogates completed a self-administered questionnaire containing measures not described in this article. Patients then completed the questionnaire while surrogates were administered the LSPQ and perceived benefit measures.

In the 2 no-discussion intervention conditions, patients and surrogates separated, and the patient completed 1 of 2 AD documents. The health care directive (HCD)²⁰ is a scenario-based AD in which respondents indicate their desire for 6 life-sustaining treatments in each of 6 medical scenarios and describe overall goals for future medical care. (The HCD used in the ADVANCE project was slightly modified from the standard version. Scenarios and treatments were

completed instructional directive improves the accuracy of substituted judgment.¹⁸ If instructional directives fail to communicate information in a way that improves the ability of surrogate decision makers to understand and predict patient preferences, then the wisdom of advocating ADs as a means of preserving patients' ability to control specific treatment decisions near the end of life is suspect. Surrogates cannot honor a patient's wishes if they do not understand those wishes.

A test of the assumption that instructional ADs improve the accuracy of substituted judgment requires a direct comparison of the accuracy of surrogate decision makers randomized to make treatment predictions with and without the benefit of reviewing a patient's completed AD. A thorough test of this assumption must also consider the possibility that different methods of documenting AD information may be differentially effective in improving the quality of surrogate decisions. The most straightforward

identical. The primary difference was that we asked about the goal of medical care once after all scenarios had been completed rather than after each scenario.) The valued life activities directive (VLA) is a value-based AD developed by our group.²⁴ Respondents are asked to think about the activities “that make your life worth living” and generate a list of activities they believe are so important to their well-being that they would not want to live if they were no longer able to engage in those activities. Both ADs were read aloud by the interviewer and patients’ responses were recorded on a paper copy. After completing the AD, patients were administered the LSPQ and perceived benefit measures. The surrogate interview began by allowing the surrogate to review the patient’s AD. The format of each directive was explained and surrogates were given as much time as desired to review the document before and during completion of the LSPQ.

In the 2 discussion intervention conditions, patients completed the AD in the presence of the surrogate. Pairs were encouraged to discuss the patient’s responses to the directive through a series of structured prompts delivered by the interviewer. These prompts asked patients to explain the reasons underlying their choices and encouraged surrogates to ask patients to clarify the reasons for their choices. (Copies of both ADs with the content and schedule of discussion prompts can be obtained from the first author [P.H.D.] on request.) After completing the AD, patients and surrogates separated and the interviews proceeded as in the other conditions.

Patients and surrogates provided standard demographic information. Patients also completed the Medical Outcomes Study 36-Item Short-Form Health Survey³² and the Center for Epidemiological Studies Depression Scale 10.³³

STATISTICAL ANALYSIS

Characteristics of patients agreeing and refusing to participate were compared with *t* tests for continuous variables and χ^2 tests for categorical variables. Similar analyses compared characteristics of patients and surrogates randomized to the 5 experimental conditions.

Responses on the LSPQ were dichotomized into “want treatment” (“definitely want,” “probably want,” or “unsure”) and “don’t want treatment” (“probably do not want” and “definitely do not want”) responses for each of the 35 treatment decisions. (Following past research,^{10,11,13} “unsure” responses were categorized with “want treatment” responses because in most instances the clinical default is to provide treatment unless specifically refused.^{10,11,16} Analyzing data excluding “unsure” responses or treating them as a third response category produced no significant differences in the study results.) Proportion indexes were generated for preferences and predictions in each scenario by summing the number of “want treatment” responses within

each scenario and dividing by the number of decisions in that scenario. Repeated-measures analyses of variance compared preference-prediction indexes across illness scenarios and the overall proportion of want treatment responses given by patients and surrogates.

Surrogate predictions were defined as *accurate* if for a given treatment decision surrogates and patients gave the same dichotomized response. Inaccurate predictions were categorized into *overtreatment errors* (surrogate predicted patient would want treatment when patient actually did not) and *undertreatment errors* (surrogate predicted patient would not want treatment when patient actually did). Proportion indexes were created for each scenario by summing the number of accurate predictions within each scenario and dividing by the number of decisions in that scenario. Multivariate analysis of variance (MANOVA) was used to simultaneously compare these 9 indexes across experimental conditions. Dunnett post hoc tests³⁴ further compared each of the 4 intervention conditions with the no-AD control condition. This process was repeated with overtreatment and undertreatment indexes. To confirm the results of the scenario-based analyses, an analogous set of analyses was conducted using proportion indexes calculated for each treatment (collapsed across medical scenarios) as dependent variables. Finally, to examine whether the interventions were differentially effective for different subgroups of participants, MANOVAs were reconducted using selected patient (sex, age, education, report of prior AD completion), surrogate (sex, age, education), and patient-surrogate relationship (type and length of relationship) characteristics as a second independent variable with experimental condition.

To examine the effects of the interventions on the secondary outcome measures, 2 MANOVAs were conducted. The first included the 5 patient-perceived benefit measures as dependent variables. The second included the 5 surrogate-perceived benefit measures as dependent variables. Subgroup analyses were again conducted to examine for differential effects of the interventions for different groups of participants.

POWER ANALYSIS

Setting α at .05 and statistical power at .80, our primary analyses (MANOVAs comparing 5 groups with 9 dependent variables) require 58 observations per condition to detect large effects and 105 observations per condition to detect medium-size effects.³⁵ Our secondary analyses (MANOVAs comparing 5 groups with 4 dependent variables) require 72 observations per condition to detect medium-size effects. Accordingly, we set 80 patient-surrogate pairs per condition as our target sample size to provide us with adequate power to detect medium-size to large effects.

approach to AD documentation is to record patients’ preferences for specific medical treatments in specific medical scenarios.^{19,20} Some have argued that this approach supplies inadequate guidance to surrogates facing treatment choices that differ from those in the scenario-based directive,^{21,22} and advocate instead the use of ADs that focus on the general values underlying specific choices about end-of-life care.^{23,24} More recent proposals have moved away from reliance on documents altogether to advocate a

broader process of advance care planning.^{25,26} This approach is based on the belief that discussions with loved ones that accompany the process of AD completion are at least as valuable as the resulting document itself in promoting understanding of a patient’s wishes. At present, no empirical evidence exists to support the effectiveness of any of these approaches in improving the accuracy of surrogate decisions, and thus arguments about the superiority of one approach over another are premature.

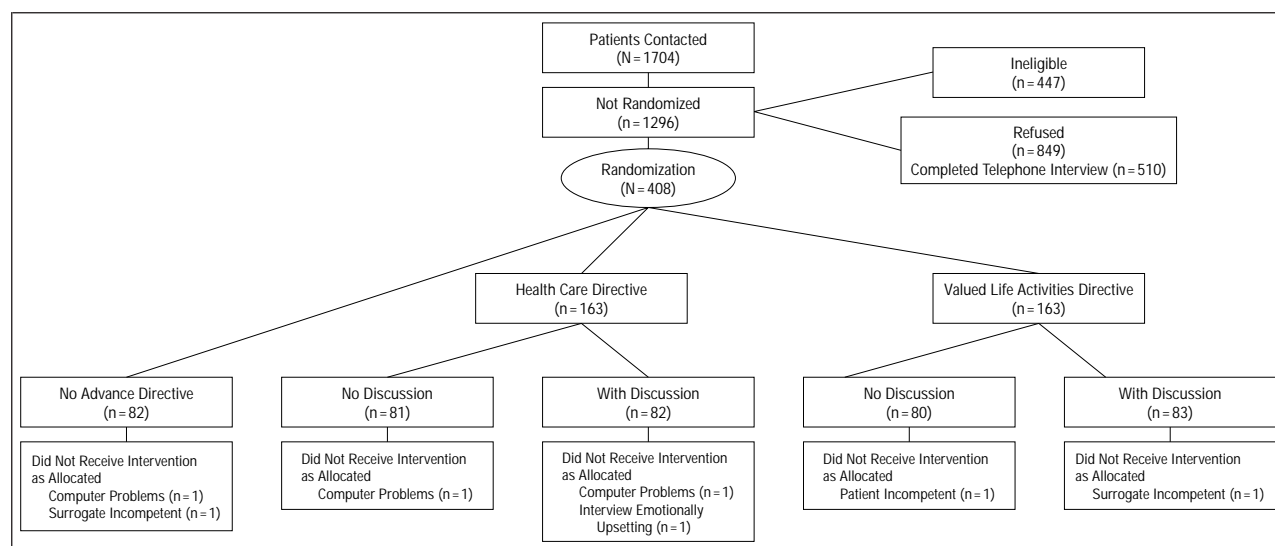


Figure 1. Randomization of participants in the ADVANCE (Advance Directives, Values Assessment, and Communication Enhancement) project.

The Advance Directives, Values Assessment, and Communication Enhancement (ADVANCE) project was a 3-phase, longitudinal study designed to test key assumptions underlying the use of instructional ADs. This article describes the results of phase 1 of the ADVANCE project: a randomized controlled trial designed to evaluate the effectiveness of 2 instructional directives, completed with and without patient-surrogate discussion, to improve the accuracy of surrogate substituted judgment.

RESULTS

SAMPLE CHARACTERISTICS

Patients agreeing to participate in the study were significantly younger than refusers (mean ages, 73 years vs 75 years; $P < .001$) and less likely to be women (56% vs 62%; $P = .03$). Participating patients were also significantly more likely than refusers to report having made plans for future medical care (69% vs 57%; $P = .001$) and to rate having plans for future care as important (mean, 4.51 vs 3.84; $P < .001$).

No statistically significant differences across intervention conditions were found on any patient or surrogate characteristic, confirming that randomization was successful. Overall, patients and surrogates were predominantly European American and Protestant, with relatively high socioeconomic status (**Table 1**). A slight minority of patients reported having a living will or other AD, while a slight majority reported having a durable power of attorney for health care. Surrogates were typically spouses or adult children of patients and most (78%) reported knowing the patient for 40 years or more.

PATIENT PREFERENCES AND SURROGATE PREDICTIONS

Preferences for treatment varied significantly across illness scenarios ($P = .001$). Patient preferences ranged from an almost unanimous desire to receive all life-sustaining treatments in their current health (mean proportion of want responses, 0.96) to high rates of treatment rejection in the

“coma no chance” scenario (mean, 0.12; **Figure 2**). Surrogate predictions showed a similar pattern to patient preferences. Surrogates predicted greater desire for treatment than that expressed by patients (overall mean proportion of want, 0.54 vs 0.44, respectively, $P = .001$). The interventions had no effect on preferences or predictions.

ACCURACY OF SUBSTITUTED JUDGMENT

Surrogates predicting patient preferences without the benefit of an AD showed only modest accuracy in their substituted judgments (**Table 2**). Although surrogates in the no-AD condition demonstrated relatively high accuracy in the “current health” scenario (mean proportion of correct predictions, 0.94), surrogate predictions were correct less than 70% of the time on average for the “Alzheimer disease,” “coma slight chance,” “stroke no chance,” “stroke slight chance,” and “cancer no pain” scenarios (overall predictive accuracy in the no-AD condition, 0.72). In general, accuracy levels closely mirrored the degree of variation in patients’ preferences with surrogates predicting most accurately for scenarios in which most patients either wanted (eg, current health) or did not want (eg, coma no chance) to receive treatment. The majority of errors made by surrogates in the no-AD condition were errors of overtreatment, with the ratio of overtreatment to undertreatment errors ranging from 2:1 in the “current health” scenario to greater than 3:1 in the “emphysema,” “coma no chance,” “coma slight chance,” and “stroke no chance” scenarios.

The AD interventions failed to improve the accuracy of surrogate substituted judgment (scenario MANOVA, $F_{36,1422} = 1.15$, $P = .25$; treatment MANOVA, $F_{16,1174} = 0.66$, $P = .83$; **Table 2**). Dunnett post hoc tests confirmed that neither no-discussion intervention produced improvements in surrogate predictive accuracy (in any illness scenario or for any type of medical treatment) beyond the level observed in the no-AD control condition (overall mean predictive accuracy for HCD no discussion, 0.75, VLA no discussion, 0.73). Discussion was equally ineffective in improving surrogate accu-

Table 1. Patient and Surrogate Characteristics*

Characteristic	Patients (n = 401)	Surrogates (n = 401)
Age, mean ± SEM, y	73.0 ± 0.3	62.5 ± 0.7
Female	224 (56)	270 (67)
Race, white	370 (92)	369 (92)
Married	273 (68)	343 (86)
Education		
<High school diploma	74 (19)	38 (10)
High school diploma	152 (38)	145 (36)
>High school diploma	173 (43)	218 (54)
Income, \$		
≤14 999	87 (22)	35 (9)
15 000-29 999	139 (35)	127 (32)
≥30 000	123 (31)	190 (47)
Refused to provide	52 (13)	49 (12)
Religious affiliation		
Protestant	276 (69)	263 (66)
Catholic	93 (23)	94 (24)
Other	32 (8)	43 (11)
Self-reported general health†		
Very good or excellent	192 (48)	NA
Good	139 (35)	NA
Fair or poor	70 (18)	NA
CESD-10 score ≥10‡	59 (15)	NA
With AD or living will	184 (46)	NA
With DPAHC	208 (52)	NA
Patient-surrogate relationship		
Spouse	246 (62)	
Child	114 (29)	
Other	37 (9)	
Length of relationship, mean ± SEM, y	46.9 ± 0.6	

*Data are given as number (percentage) of participants except as otherwise noted and may not total due to missing values. NA indicates not applicable; AD, advance directive; CESD-10, Center for Epidemiological Studies Depression Scale; and DPAHC, durable power of attorney for health care.

†From Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36).

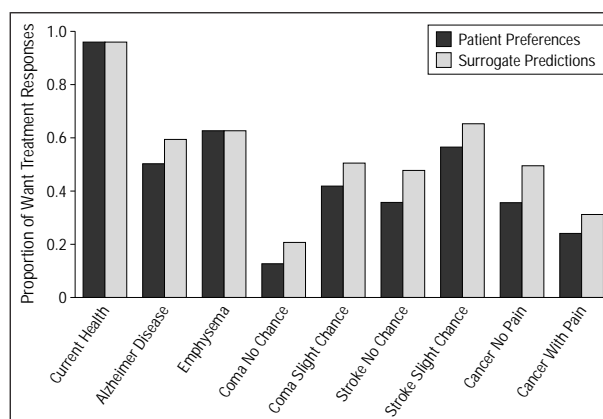
‡Scores ≥10 indicate depressive symptoms.

racy. Surrogates allowed to complete and discuss the ADs with the patient were also unable to predict patients' treatment wishes at accuracy levels that exceeded those of surrogates making predictions without the benefit of an AD (overall mean predictive accuracy for HCD discussion, 0.73, VLA discussion, 0.69). Overtreatment and undertreatment errors showed no significant differences across study conditions.

Planned subgroup analyses did not identify any subgroup of patients, surrogates, or patient-surrogate relationships for which any of the AD interventions produced levels of predictive accuracy greater than those observed in the no-AD control condition.

PERCEIVED BENEFITS OF AD COMPLETION

More than 90% of patients in the no-AD condition believed that their surrogate understood their life-sustaining treatment wishes at least "pretty well" and were at least "pretty confident" that their surrogate could accurately predict their wishes (top of **Table 3**). Most no-AD patients also believed that their surrogate would honor their wishes (89%), but fewer believed surrogates were comfortable making medical decisions for them

**Figure 2.** Patient preferences and surrogate predictions.

(69%). Surrogates' responses to analogous questions were similar to those of patients (bottom of Table 3).

Patient measures revealed a significant intervention effect ($F_{20,1275} = 2.73$, $P < .001$). Dunnett post hoc tests indicate that both discussion interventions produced small but significant increases in patients' perceptions of surrogate understanding relative to the no-AD control condition ($P < .001$ for all; Table 3). The VLA discussion intervention produced a similar increase in patients' perceptions of surrogate comfort ($P = .05$). Subgroup analyses revealed that the effects of the discussion interventions on perceived understanding and comfort were limited to patients without a previously completed AD (intervention \times AD interaction, $F_{20,1248} = 1.62$, $P = .04$). In the no-AD condition, patients with a prior AD believed their surrogate to have both better understanding of their wishes (mean, 4.56) and greater comfort with making end-of-life decisions (mean, 4.15) than did patients without a previous AD (means, 4.20 and 3.34, respectively, $P < .02$ for all). The discussion interventions did little to improve the already high level of perceived understanding and comfort in patients with a previous AD ($P > .39$ for all). Both discussion interventions, however, produced significant increases in perceived understanding (HCD discussion mean, 4.89, VLA discussion mean, 4.84) and perceived comfort (HCD discussion mean, 4.03, VLA discussion mean, 4.12) for patients without a previous AD ($P < .01$ for all).

Surrogate measures did not differ by experimental condition ($F_{20,1284} = 1.30$, $P = .17$). Dunnett post hoc tests, however, reveal that surrogates in the HCD discussion condition had significantly higher scores (relative to the no-AD condition) on perceived understanding of patients' wishes ($P = .04$), confidence in their own predictive accuracy ($P = .02$), and belief in the importance of having an AD ($P = .01$). The VLA discussion intervention also produced a slight increase in surrogates' perceived comfort ($P = .08$). Subgroup analyses revealed no significant qualifications of these effects.

COMMENT

Phase 1 of the ADVANCE project revealed only modest accuracy of surrogate decisions uninformed by instructional ADs. Most surrogates were spouses or children of

Table 2. Proportion of Accurate Surrogate Predictions, Overtreatment Errors, and Undertreatment Errors by Experimental Condition*

Index	No AD (n = 77)	HCD No Discussion (n = 79)	VLA No Discussion (n = 78)	HCD Discussion (n = 78)	VLA Discussion (n = 80)	Total (N = 392)
Current Health	0.94 ± 0.02	0.97 ± 0.01	0.95 ± 0.02	0.96 ± 0.01	0.94 ± 0.02	0.95 ± 0.01
Overtreatment	0.04 ± 0.01	0.02 ± 0.01	0.03 ± 0.01	0.01 ± 0.01	0.05 ± 0.02	0.03 ± 0.01
Undertreatment	0.02 ± 0.01	0.02 ± 0.01	0.02 ± 0.01	0.03 ± 0.01	0.01 ± 0.01	0.02 ± 0.00
Alzheimer Disease	0.65 ± 0.04	0.66 ± 0.04	0.70 ± 0.04	0.70 ± 0.03	0.63 ± 0.04	0.67 ± 0.02
Overtreatment	0.25 ± 0.04	0.16 ± 0.03	0.22 ± 0.03	0.21 ± 0.03	0.23 ± 0.04	0.21 ± 0.02
Undertreatment	0.10 ± 0.03	0.17 ± 0.03	0.09 ± 0.03	0.09 ± 0.02	0.14 ± 0.03	0.12 ± 0.01
Emphysema	0.73 ± 0.04	0.77 ± 0.03	0.68 ± 0.04	0.70 ± 0.04	0.66 ± 0.04	0.71 ± 0.02
Overtreatment	0.21 ± 0.03	0.12 ± 0.03	0.26 ± 0.04	0.23 ± 0.04	0.24 ± 0.04	0.21 ± 0.02
Undertreatment	0.06 ± 0.02	0.11 ± 0.03	0.06 ± 0.02	0.07 ± 0.02	0.10 ± 0.02	0.08 ± 0.01
Coma No Chance	0.78 ± 0.04	0.83 ± 0.03	0.83 ± 0.03	0.86 ± 0.03	0.81 ± 0.04	0.82 ± 0.02
Overtreatment	0.17 ± 0.04	0.10 ± 0.03	0.13 ± 0.03	0.12 ± 0.03	0.14 ± 0.03	0.13 ± 0.01
Undertreatment	0.05 ± 0.02	0.07 ± 0.02	0.05 ± 0.02	0.03 ± 0.01	0.05 ± 0.02	0.05 ± 0.01
Coma Slight Chance	0.68 ± 0.04	0.68 ± 0.04	0.66 ± 0.04	0.63 ± 0.04	0.62 ± 0.05	0.66 ± 0.02
Overtreatment	0.24 ± 0.04	0.18 ± 0.03	0.23 ± 0.04	0.20 ± 0.04	0.23 ± 0.04	0.22 ± 0.02
Undertreatment	0.07 ± 0.02	0.14 ± 0.03	0.12 ± 0.03	0.16 ± 0.03	0.15 ± 0.03	0.13 ± 0.01
Stroke No Chance	0.62 ± 0.04	0.73 ± 0.03	0.63 ± 0.05	0.68 ± 0.04	0.63 ± 0.04	0.66 ± 0.02
Overtreatment	0.28 ± 0.04	0.15 ± 0.02†	0.25 ± 0.04	0.18 ± 0.04	0.28 ± 0.04	0.23 ± 0.02
Undertreatment	0.09 ± 0.02	0.12 ± 0.03	0.12 ± 0.03	0.14 ± 0.03	0.09 ± 0.03	0.11 ± 0.01
Stroke Slight Chance	0.69 ± 0.04	0.69 ± 0.04	0.69 ± 0.04	0.74 ± 0.04	0.58 ± 0.04	0.68 ± 0.02
Overtreatment	0.21 ± 0.04	0.15 ± 0.03	0.20 ± 0.04	0.15 ± 0.03	0.30 ± 0.04	0.20 ± 0.02
Undertreatment	0.09 ± 0.02	0.16 ± 0.03	0.11 ± 0.03	0.11 ± 0.03	0.11 ± 0.03	0.12 ± 0.01
Cancer No Pain	0.66 ± 0.04	0.70 ± 0.04	0.68 ± 0.04	0.68 ± 0.04	0.61 ± 0.04	0.66 ± 0.02
Overtreatment	0.25 ± 0.04	0.18 ± 0.03	0.24 ± 0.04	0.19 ± 0.04	0.31 ± 0.04	0.23 ± 0.02
Undertreatment	0.09 ± 0.02	0.12 ± 0.03	0.08 ± 0.02	0.13 ± 0.03	0.08 ± 0.02	0.10 ± 0.01
Cancer With Pain	0.79 ± 0.03	0.74 ± 0.04	0.77 ± 0.04	0.67 ± 0.04	0.75 ± 0.04	0.74 ± 0.02
Overtreatment	0.15 ± 0.03	0.14 ± 0.03	0.13 ± 0.03	0.20 ± 0.04	0.20 ± 0.04	0.16 ± 0.02
Undertreatment	0.06 ± 0.02	0.12 ± 0.03	0.09 ± 0.03	0.13 ± 0.03	0.05 ± 0.02	0.09 ± 0.01
Total	0.72 ± 0.02	0.75 ± 0.02	0.73 ± 0.02	0.73 ± 0.02	0.69 ± 0.02	0.72 ± 0.01
Overtreatment	0.21 ± 0.02	0.14 ± 0.01	0.19 ± 0.02	0.17 ± 0.02	0.22 ± 0.02	0.19 ± 0.01
Undertreatment	0.07 ± 0.01	0.12 ± 0.02	0.08 ± 0.01	0.10 ± 0.01	0.09 ± 0.01	0.09 ± 0.01

*Data are given as mean ± SEM. AD indicates advance directive; HCD, health care directive; and VLA, valued life activities directive.

†P<.05 on Dunnett post hoc test.

patients, had known the patient for 40 years or more, and were confident in their ability to predict patients' treatment preferences. Patients were equally confident in surrogates' predictive abilities. Despite this mutual confidence, surrogates making predictions without the benefit of an AD inaccurately predicted patients' desire to receive life-sustaining treatment in approximately 3 of every 10 decisions. Both the overall rate of prediction errors and the tendency for surrogates to overpredict patients' desire for life-sustaining treatment are similar to patterns shown in previous studies.^{11,13-15}

The novel contribution of our study is its unequivocal demonstration of the ineffectiveness of both instructional ADs and patient-surrogate discussion to improve the accuracy of surrogate substituted judgment. Empirical data on surrogate inaccuracy have often been taken as support for ADs based on the assumption that possession of a patient's instructional directive would improve surrogate decisions.^{14,36,37} The results of our study challenge this assumption. Our randomized trial design provided a stringent test of the ability of 4 different AD interventions to improve the accuracy of surrogate predictions. The results were clear and consistent across all 4 interventions and over every treatment decision examined. The ineffectiveness of an AD document alone to improve surrogate decisions might have been expected based on past writings skeptical of the usefulness of written di-

rectives in the absence of a broader process of advance care planning.^{25,26} More surprising was the finding that supplementing a written directive with guided patient-surrogate discussion was equally ineffective. This was true despite the fact that many patients and surrogates perceived the discussion interventions to improve shared understanding of patients' treatment wishes.

The present study extends past research documenting numerous practical problems facing attempts to improve the quality of end-of-life medical care.³⁸⁻⁴⁵ The largest and best-known study, SUPPORT (Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments),³⁸ found that a multifaceted intervention designed to facilitate advance care planning and improve patient-physician communication failed to produce significant improvements in the care and outcomes of seriously ill hospitalized patients. Our study differs from SUPPORT in several important ways. Although one goal of the SUPPORT intervention was to facilitate the documentation of treatment wishes in advance of decisional incapacitation, the study did not require that patients complete detailed ADs or that family members or physicians discuss or even read any directives that were completed. In fact, SUPPORT was crucial in documenting that patients often complete directives containing little or no clinically useful information,⁴² that completed directives are often not placed or their existence even men-

Table 3. Responses to Perceived Benefit Questions by Experimental Condition

Question/Response	No AD (n = 80)	HCD No Discussion (n = 80)	VLA No Discussion (n = 79)	HCD Discussion (n = 80)	VLA Discussion (n = 82)	Total (N = 401)
Patient						
Surrogate understands?	4.36 ± 0.08	4.53 ± 0.07	4.40 ± 0.09	4.84 ± 0.04†	4.75 ± 0.05†	4.58 ± 0.03
At least pretty well	74 (93)	76 (95)	70 (89)	80 (100)	81 (99)	381 (95)
Surrogate is accurate?	4.53 ± 0.08	4.55 ± 0.07	4.58 ± 0.08	4.72 ± 0.05	4.56 ± 0.08	4.59 ± 0.03
At least pretty confident	74 (93)	76 (96)	74 (94)	79 (99)	77 (94)	380 (95)
Surrogate will honor wishes?	4.19 ± 0.09	4.08 ± 0.10	4.22 ± 0.11	4.35 ± 0.09	4.35 ± 0.10	4.24 ± 0.04
At least pretty sure	69 (89)	65 (83)	64 (82)	69 (86)	72 (89)	339 (86)
Surrogate is comfortable	3.68 ± 0.13	3.82 ± 0.11	3.94 ± 0.11	3.99 ± 0.11	4.07 ± 0.11†	3.90 ± 0.05
At least pretty comfortable	55 (69)	54 (68)	55 (70)	61 (76)	63 (77)	288 (72)
Having an AD is important?	4.38 ± 0.09	4.53 ± 0.09	4.51 ± 0.09	4.48 ± 0.11	4.57 ± 0.09	4.49 ± 0.04
At least pretty important	67 (84)	67 (85)	71 (90)	69 (86)	77 (94)	351 (88)
Surrogate						
I understand patient's wishes?	4.36 ± 0.08	4.45 ± 0.07	4.51 ± 0.07	4.61 ± 0.05†	4.54 ± 0.07	4.49 ± 0.03
At least pretty well	75 (94)	78 (98)	77 (98)	80 (100)	79 (96)	389 (97)
I am accurate?	4.32 ± 0.07	4.40 ± 0.07	4.48 ± 0.07	4.61 ± 0.06†	4.39 ± 0.09	4.44 ± 0.03
At least pretty confident	74 (93)	77 (96)	73 (92)	78 (98)	73 (89)	375 (94)
I will honor patient's wishes?	4.18 ± 0.09	4.36 ± 0.08	4.18 ± 0.09	4.31 ± 0.08	4.27 ± 0.11	4.26 ± 0.04
At least pretty sure	71 (90)	70 (88)	64 (81)	72 (90)	69 (86)	346 (87)
I am comfortable?	3.71 ± 0.11	3.89 ± 0.10	3.84 ± 0.12	4.01 ± 0.10	4.06 ± 0.11†	3.90 ± 0.05
At least pretty comfortable	50 (63)	57 (71)	56 (71)	59 (74)	60 (73)	282 (71)
Having an AD is important?	4.35 ± 0.10	4.55 ± 0.09	4.53 ± 0.08	4.71 ± 0.06†	4.59 ± 0.10	4.55 ± 0.04
At least pretty important	68 (85)	70 (88)	74 (94)	77 (96)	74 (91)	363 (91)

*Data for questions are given as mean ± SEM, and data for responses are given as number (percentage). AD indicates advance directive; HCD, health care directive, and VLA, valued life activities directive.

†P < .05 on Dunnett post hoc test.

‡P < .10 on Dunnett post hoc test.

tioned in medical charts,^{38,39} and that even when a directive is seen by a physician, physicians infrequently discuss the directive with the patient or the patient's family.³⁸ In contrast, patients in the intervention arms of the ADVANCE project were required to complete detailed instructional directives, surrogates were required to read them, and some surrogates were required to discuss them with the patient. Even under these ideal conditions, however, our interventions were completely ineffective in improving the accuracy of surrogate substituted judgment. These results suggest that even if all of the practical problems documented by SUPPORT can be surmounted, instructional ADs may still fall short of their goal of preserving patient self-determination because they fail to communicate information in a way that improves surrogates' ability to honor patients' specific treatment decisions.

POTENTIAL LIMITATIONS OF THE STUDY

Our patients and surrogates were generally healthy, well educated, and European American. Compared with individuals in the same medical practices who refused to participate, our patients were younger, more likely to be male, and more positively inclined toward making plans for future medical care. The percentage of patients reporting a previous AD was also higher than rates reported in other studies.⁴⁶⁻⁴⁹ Because attitudes toward end-of-life care have been found to vary across demographic and ethnic groups,^{15,50-54} the unique characteristics of our sample must be considered in evaluating our results. Still, the fact that instructional ADs were found to be ineffec-

tive in a relatively educated sample of individuals motivated to make plans for their future medical care does not bode well for their success more generally.

It is possible that other AD documents might prove more effective in enhancing the accuracy of substituted judgment. The directives used in our study, however, included treatment instructions much more detailed than the vague expression of wishes contained in most living wills.⁴² The HCD is a prototypical scenario-based AD with considerable empirical evidence involved in its development.^{19,20,55-57} The VLA directive was developed from research showing that assessments of health-related quality of life are based on outcome and function^{24,58,59} as well as suggestions that identifying a threshold for medical situations perceived as "worse than death" might prove useful in end-of-life decision making.^{26,60,61} It could be argued that the VLA directive was too general to allow easy application by surrogates to specific treatment decisions. The HCD, however, was equally ineffective in improving surrogate decisions, even in scenarios that closely resembled specific HCD scenarios (eg, the coma no chance and slight chance scenarios). The fact that 2 detailed, empirically derived, but otherwise quite different instructional directives proved equally ineffective in improving surrogate substituted judgment supports the generalizability of our findings.

It is also possible that a more elaborate or long-term discussion intervention might be effective in enhancing surrogate accuracy. Although intensive and focused, our intervention was a brief, single-session discussion without the guidance of a physician or any explicit educational component. We agree that any ben-

eficial effects of discussing end-of-life issues will likely depend on the content and quality of that discussion. Past correlational research, for example, has produced only inconsistent evidence of any association between naturally occurring patient-surrogate discussion and surrogate accuracy.^{11,14-16,62-65} What our results clearly show is that despite the faith placed by many physicians^{15,26,63} (and many of our study participants) in the beneficial effects of discussing end-of-life issues, a structured discussion almost certainly more rigorous than most naturally occurring end-of-life discussions produced no discernible improvements in patient-surrogate understanding.

Another possible limitation of this study is its reliance on a particular set of hypothetical illness scenarios. Because the LSPQ was constructed based on an extensive review of previous surrogate decision-making research to include a broad range of realistic life-sustaining treatment decisions, it is unlikely that inclusion of other hypothetical treatment choices would change the observed results. Still, future research should examine the effectiveness of ADs with patients facing chronic or progressive diseases for whom life-sustaining treatment decisions are less hypothetical and specific prognostic outcomes can be anticipated and discussed and preferences documented.⁶⁶

Finally, we adopted a sample size and analysis strategy that maximized the probability of finding intervention effects with the consequent risk of inflating our likelihood of type I errors. Analyses were conducted to confirm the lack of intervention effects across specific scenarios and treatments and within different subgroups of patients, surrogates, and patient-surrogate relationships. The consistency of negative results across analyses makes it unlikely that any clinically important effect of our interventions was missed.

IMPLICATIONS FOR POLICY AND RESEARCH

The increasing institutionalization of ADs in US law and medical practice stands in stark contrast to a growing body of research challenging the effectiveness of advance care planning to produce specific improvements in end-of-life medical care.³⁸⁻⁴⁵ This inconsistency raises questions about whether policy and law should continue to encourage the use of ADs and what directions empirical and ethical analysis should take to help address this issue.

One direction for future research is to attempt to develop more effective methods of improving the accuracy of surrogate decision making. This research must move beyond simple documents to long-term intervention strategies and should be guided by basic research in communication and human decision making rather than the mixture of common sense, legal analysis, and political consensus underlying many current approaches (eg, state-specific living will forms). Moreover, additional consideration needs to be given to the difficult ethical question of what constitutes an "acceptable" level of surrogate accuracy. Interpretation of the present findings differs depending on the level of concordance considered indicative of adequate surrogate understanding.

Alternatively, a recent review of the cumulative findings of SUPPORT^{67,68} concludes that the initial guiding assumption of that study—that enhanced patient-level decision making is the key to quality end-of-life care—was fundamentally flawed. Research may show that it is either impossible or prohibitively difficult to improve the ability of surrogates to predict patient preferences for specific treatments in specific medical circumstances. Surrogate decision making is likely subject to the same limitations as other forms of "clinical" judgment.⁶⁹⁻⁷¹ The accuracy of surrogate decisions may also be limited by the tendency of patients' life-sustaining treatment preferences to change over time.⁷²⁻⁷⁴ Surrogates cannot be expected to predict patients' future treatment wishes better than patients can predict their own.⁶⁸

Even if the accuracy of surrogate decision making has some theoretical or practical limit, however, ADs may still have an important role in end-of-life decision making. Although instructional directives may not improve decisions made by family members, they may be more effective in improving the poorer accuracy expected from decision makers with little or no past relationship with the patient such as an emergency department physician (see article by Coppola et al in this issue⁷⁵). Advanced directives are also likely to have a number of psychological benefits for patients and their families, particularly if their completion serves to stimulate discussion of end-of-life issues. Our discussion interventions were found to produce a sense of mutual understanding and comfort with end-of-life decision making. These effects were minimal for pairs in which the patient had previously completed an AD but were more pronounced for pairs in which the discussion of end-of-life issues was presumably more novel. Improved satisfaction with decision making was also the only identifiable positive effect of the SUPPORT intervention.⁷⁶

The question that remains is how to evaluate these psychological benefits in the absence of actual improvements in the accuracy of substituted judgment. Because law and policy advocating ADs has always been deeply rooted in the preservation of patient self-determination,^{1,6,7} the goal of improving the accuracy of surrogate decision making is not easily abandoned. At the same time, however, patients and families facing real decisions about end-of-life treatment often seem less concerned with the ability to predict specific treatment decisions than they are with gaining a general sense of control over the dying process and reducing the level of burden on surrogate decision makers.⁷⁷⁻⁸¹

The results of the present study clearly challenge the effectiveness of instructional ADs as a means of preserving patients' ability to control specific treatment decisions near the end of life. What is less clear is the extent to which the majority of patients and surrogates desire this level of control and the relative value to assign to the goals of accurate surrogate decision making vs psychological benefits in future policy development. A final evaluation of the wisdom of advocating instructional directives as a means of improving end-of-life medical care requires additional debate, and eventually a broader consensus, regarding the specific outcomes we hope ADs to achieve.

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