Context Changes Choices: A Prospective Study of the Effects of Hospitalization on Life-Sustaining Treatment Preferences

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An important shift has occurred in American medicine over the past 2 decades toward acknowledging the fundamental right of seriously ill individuals to make their own choices about the use of life-sustaining medical treatment.1 Assertion of this right in actual end-of-life situations, however, is complicated by the fact that at the time decisions must be made about whether to use or forgo such treatment, many patients are already so sick that they have lost the capacity to make these choices for themselves.2

Instructional advance directives (e.g., living wills) are widely endorsed as the solution to this problem.3–6 On the surface, the solution seems elegant in its simplicity. If wishes for the use of life-sustaining treatment are recorded prior to incapacitating illness, then patients’ ability to influence the medical care they receive can be maintained even after they have lost the ability to decide for themselves.

Policy and law encouraging the use of instructional advance directives, however, rests on a number of psychological assumptions of questionable validity.7,8 Most fundamentally, reliance on treatment preferences generated in advance of serious illness assumes that healthy individuals can anticipate their reactions to future disease states and predict their preferences...
for various life-sustaining treatments. If healthy individuals cannot predict accurately their reactions to serious illness—for example, because life-sustaining treatment decisions are affected by changes in an individual’s physical or psychological condition—then treatment decisions made in advance of serious illness should not be taken as authentic representations of the decisions an incapacitated individual would make if he or she were currently able.

In fact, the assumption that healthy individuals can predict accurately their reactions to future illness is challenged by growing bodies of research in both the psychological and medical literatures. Research on “affective forecasting,” for example, has shown that individuals make systematic errors when trying to predict their emotional reactions and behavioral choices in future situations.\textsuperscript{9,10} Similarly, a number of studies have found healthy people to assign different utilities to disease states and treatments than do individuals with direct personal experience with the disease or treatment.\textsuperscript{11–15}

The best of these studies use prospective designs in which assigned utilities from the same individuals are collected both prior to and after experiencing the event of interest.\textsuperscript{12,13,16} In a well-known study by Christensen-Szalanski,\textsuperscript{12} for instance, preferences for the use of anesthesia during labor were solicited several times before, during, and after childbirth. One month before labor and in early labor, women expressed a clear preference to avoid anesthesia. As labor progressed and the women experienced significant discomfort, however, preferences shifted strongly toward choosing anesthesia. Importantly, when the same women were interviewed again 1 month after delivery, they had returned to their prechildbirth preference for avoiding anesthesia.

If life-sustaining treatment choices show a similar context dependency, the underlying premise of instructional advance directives is challenged. Of course, the ideal prospective study in which preferences stated by a healthy individual are compared to those of that same individual when incapacitated is impossible. A more feasible alternative is to examine life-sustaining treatment preferences stated before and after treatment for a condition that requires hospitalization but is not so serious as to result in incapacitation or the use of life-sustaining therapy. The frequency of hospitalization in older adults makes it amenable to prospective examination. Moreover, although in most cases it will be only a relatively weak approximation of the impact caused by life-threatening illness requiring decisions about the use of life-sustaining treatment, any hospitalization experience is likely to result in some important degree of discomfort, dependency, and distress. If life-sustaining treatment preferences change after experience with non-life-threatening hospitalization, this result would certainly cast doubt on the stability of such preferences in the face of more serious illness.

This study uses a prospective design, modeled after Christensen-Szalanski,\textsuperscript{12} to examine elderly adults’ desire for the use of life-sustaining medical treatment prior to, soon after, and several months after a hospitalization experience. Most previous studies have found that individuals having direct experience with health states and treatments assign higher utilities to them (i.e., perceive them more positively) than do individuals without such experience.\textsuperscript{11,13–15} A recent study of current and former colostomy patients has also found that individuals for whom a medical condition has been resolved assign lower utilities to the condition than do individuals currently experiencing the condition.\textsuperscript{17} In contrast, the Christensen-Szalanski study\textsuperscript{12} found that women seemed to perceive labor more negatively (i.e., as more painful) while they were experiencing it than they did before or well after the experience. Similarly, past research has found increases in depression (one likely result of hospitalization) to be associated with both increased\textsuperscript{18} and decreased\textsuperscript{19} desire for life-sustaining treatment. Thus, although prior studies offer conflicting guidance regarding the specific effects hospitalization might have on life-sustaining treatment preferences, they converge on the prediction that any preference change resulting from hospitalization is itself likely to be temporary and will change again as any physical discomfort and/or emotional distress caused by hospitalization dissipates over the course of recovery. Thus, our general prediction was that life-sustaining treatment preferences would be context dependent, and they would vary significantly depending on...
whether they were elicited prior to, soon after, or several months after hospitalization.

METHOD

Overview

This investigation used data collected as part of the Advance Directives, Values Assessment, and Communication Enhancement (ADVANCE) project.\textsuperscript{20,21} The ADVANCE project was a 3-phase longitudinal study intended to test several assumptions underlying the use of instructional advance directives. The first phase of data collection (time 1) involved a randomized controlled trial assessing the effectiveness of different types of advance directive interventions for improving the agreement between elderly outpatients’ and their surrogates’ life-sustaining treatment choices.\textsuperscript{20} Phase 2 focused on the longitudinal stability of patients’ preferences measured 1 (time 2) and 2 (time 3) years after the initial phase 1 interview.\textsuperscript{21} Phase 3, the focus of the present investigation, used a prospective design involving a subset of patients who happened to be hospitalized during their participation in the project.

Subjects and Data Collection

ADVANCE subjects were recruited from lists of outpatients aged 65 and older obtained from 6 primary care practices affiliated with Summa Health Systems in Akron, Ohio.\textsuperscript{20} Potential subjects were contacted by letter and later by telephone to determine their eligibility and willingness to participate in a 2-year longitudinal study investigating the life-sustaining treatment preferences of older adults. Initial interview data were collected from 401 subjects at time 1, and 332 (83\%) of these subjects remained in the study through time 3.

On a weekly basis, hospital admissions personnel notified ADVANCE project staff whenever one of our subjects was hospitalized for more than 48 hours at either of Summa Health System’s 2 hospitals. During the 2 years of the study, 103 subjects (26\% of the total sample) met this hospitalization criterion at least once. Slightly more subjects were hospitalized between times 1 and 2 (58\%) than between times 2 and 3.

Hospitalized subjects were contacted to complete an additional interview that was scheduled to take place as soon as possible after the subject had been released from the hospital. We will refer to this as the recovery interview because it was designed to reflect subject preferences in the midst of their recovery from the hospitalization experience. For all analyses, subjects’ prehospitalization interview data came from their most recent annual interview prior to the hospitalization that prompted their recovery interview (either time 1 or time 2), and their posthospitalization interview data came from their next annual interview (either time 2 or time 3). The amount of time that had transpired since the annual interview immediately prior to the subjects’ hospitalization did not affect the scheduling of their recovery interview. However, a minimum delay of 3 months between their recovery interview and their next annual interview was instituted to allow subjects time to recover sufficiently from their illness episode.

Of the 103 eligible subjects, 4 were unable to complete the recovery interview (e.g., 1 died within 2 weeks of being discharged, 1 was in a coma), 2 were unreachable, and 9 refused to participate. The hospitalized subjects who did and did not complete a recovery interview did not differ significantly in terms of their age, gender, education, or their baseline physical or mental health scores. Ultimately, interview data were collected successfully from 88 subjects (85\% of the hospitalized sample) during or immediately after their first hospitalization ($M = 14$ days following discharge).\textsuperscript{a}

Life-Support Preferences Questionnaire

At each annual interview, subjects completed the Life-Support Preferences Questionnaire (LSPQ)\textsuperscript{20} assessing desire to receive medical treatment in 9 different medical scenarios. To minimize respondent burden during the recovery interview, a shortened version was used that focused on only 4 of the 9 health scenarios: Alzheimer’s disease, terminal cancer with pain, coma with no chance of recovery, and stroke with a slight chance of recovery. Subjects imagined themselves in each medical condition and indicated if they would want to receive each of 4 medical treatments that varied in invasiveness: 1) cardiopulmonary resuscitation (CPR) for cardiac arrest, 2) artificial nutrition and hydration (ANH) for inability to eat or drink, 3) gall bladder surgery (GBS) for a life-threatening gall bladder infection, and 4) antibiotics for life-threatening pneumonia. Ratings were made on a 5-point scale ranging from 1 $=$ definitely do not want treatment to 5 $=$ definitely want treatment.

a. Of the 88 subjects, 16 people (18\%) were rehospitalized during the course of the study, and only 2 of these subjects refused to complete an interview after their second hospitalization. To avoid statistical dependency caused by using data from the same 14 people more than once, all the analyses were conducted using only the data from the subjects’ first hospitalization.
Secondary Measures

To glean additional information about what might account for any preference changes caused by hospitalization, a number of measures were included that could be used in moderator analyses. At all of the interviews, the short form of the Center for Epidemiologic Studies–Depression Scale (CES-D) served as a measure of depressive symptomatology. Two items were used to assess the subjects’ general health (5-point scale from excellent to poor) and physical pain (5-point scale from none to severe) at the recovery interview, and these same questions also were completed at the annual interviews as part of the Medical Outcomes Study Short Form (SF-36).

Finally, 3 questions asked at the recovery interview assessed subjects’ perceptions of the seriousness of the illness for which they required hospitalization (“How would you rate the seriousness of your current illness?” “How likely do you think it is that you will return to your normal day-to-day functioning after this illness?” “How soon do you think you will return to your normal day-to-day functioning after this illness?”). For each question, the same basic 5-point scales were used, ranging from extremely (serious/likely/soon) to not at all (serious/likely/soon).

Analysis

An overall treatment preference index was created by averaging subjects’ responses to the 16 individual preference judgments (preferences for each of 4 life-sustaining treatments in each of 4 illness scenarios). In addition, separate indices were created for each of the 4 treatments by averaging preferences for each treatment across the 4 scenarios. Changes in life-sustaining treatment preferences over time were analyzed with repeated-measures analyses of variance (ANOVAs) with interview (prehospitalization, recovery, posthospitalization) as the within-subjects factor. These ANOVAs were followed up with contrast analyses to clarify whether the pattern of any significant changes in preferences across interviews tended to be linear (consistent increases or decreases in preferences over time) or quadratic (e.g., a spike or dip in preferences at the recovery interview) in form.

To examine possible moderators of preference change, a series of general linear model analyses was conducted, with interview as the within-subjects factor and 1 of the following variables used as a continuous between-subjects factor: perceived seriousness of illness ratings, length of hospitalization, and difference scores representing changes in depressive symptomatology, general health, and bodily pain from prehospitalization to recovery.

Finally, an additional set of analyses was conducted to assess the clinical relevance of preference change across interviews. First, the 5-point preference scales were dichotomized into “want treatment” (“definitely want,” “probably want,” “probably do not want,” “definitely do not want”) categories and the proportion of want and don’t-want treatment responses remaining stable across the 3 interviews was calculated. It is possible, however, that a substantial portion of the instability captured by these dichotomized data represents very minor changes in preferences (e.g., from probably want to unsure). To account for this possibility, we examined the mean magnitude of utility loss across interviews. We assumed that our response scale was a linear measure of utility and that no change in decision (e.g., from probably to definitely want/do not want or vice versa) represented zero loss. Once a change in decision occurred, however (even from probably want/do not want to unsure), each scale point change was counted as 1 unit of utility loss. We calculated the mean magnitude of utility loss (overall and for each life-sustaining treatment) using prehospitalization preferences to predict recovery interview preferences.

For purposes of comparison, we also calculated similar utility loss measures for an actuarial decision strategy of using the most common preference in our sample (in every case, this was to not want treatment) to predict recovery interview preferences.

RESULTS

Sample Characteristics

Characteristics of the sample are shown in Table 1. Subjects were mostly European Americans (94%) who, at time 1, ranged in age from 65 to 94 years (M = 73.6). The sample contained roughly equal numbers of females (52%) and males, and a slight majority were high school graduates (M = 12.4 years of school). At the time of the hospital interview, 59% of subjects reported having an advance directive (either a living will or a durable power of attorney for health care).
On average, subjects were hospitalized for 1 week ($M = 7.2$ days, $SD = 14.3$). In general, subjects rated their illness as “somewhat” to “pretty serious” ($M = 3.6$) but believed that they were “pretty likely” to return to normal ($M = 4.3$) and to do so “pretty soon” ($M = 3.7$). The 2 most common reasons for hospitalization were orthopedic surgery (24%) and cardiovascular disease (19%). Only 2 of the 4 hypothetical illness conditions covered in the LSPQ were among the reasons for hospitalization in this sample: 10% had cancer and 4% had a stroke.

Subjects’ self-reported mental and physical health was compared across interviews using repeated-measures ANOVAs and linear and quadratic contrast analyses. Subjects’ self-reported general health changed significantly over time, $F(2, 158) = 3.06, P = 0.05$, and only the quadratic contrast was significant, $F(1, 79) = 6.29, P = 0.01$. As expected, subjects reported poorer general health at the time of the recovery interview compared to their annual interviews (see Table 1). Subjects also experienced marginal changes in depressive symptoms, $F(2, 152) = 2.78, P < 0.07$, with subjects tending to report more depressive symptoms during the recovery interview than at either annual interview. However, neither the quadratic nor the linear contrast analysis was significant. Subjects’ ratings of bodily pain did not differ significantly over time.

Change in Treatment Preferences across Interviews

Repeated-measures ANOVAs comparing mean desire for treatment across the 3 interviews showed significant differences for the total LSPQ score, $F(2, 154) = 3.79, P < 0.05$, and the CPR and ANH subindices, $F$s = 4.57, $P$s < 0.02. In all 3 cases, the quadratic contrasts were significant, $F$s = 4.28, $P$s < 0.03. As shown in Figure 1, subjects’ preferences for receiving CPR and ANH showed a “hospitalization dip” at the recovery interview. That is, subjects expressed less interest in receiving each treatment immediately after hospitalization than they did either prior to

Table 1  Sample Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients (N = 88)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (SD)</td>
<td>73.6 (5.6)</td>
</tr>
<tr>
<td>Gender, no. (%) female</td>
<td>46 (52)</td>
</tr>
<tr>
<td>Race, no. (%) European</td>
<td>83 (94)</td>
</tr>
<tr>
<td>Mean years of education (SD)</td>
<td>12.4 (2.6)</td>
</tr>
<tr>
<td>No. (%) with AD/living will</td>
<td>15 (17)</td>
</tr>
<tr>
<td>No. (%) with DPAHC</td>
<td>1 (1)</td>
</tr>
<tr>
<td>No. (%) with both</td>
<td>36 (40)</td>
</tr>
<tr>
<td>Reason for hospitalization, no. (%)</td>
<td></td>
</tr>
<tr>
<td>Orthopedic</td>
<td>21 (24)</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>17 (19)</td>
</tr>
<tr>
<td>Cancer</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Digestive</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>8 (9)</td>
</tr>
<tr>
<td>Infection</td>
<td>8 (9)</td>
</tr>
<tr>
<td>Fainted</td>
<td>7 (8)</td>
</tr>
<tr>
<td>Stroke</td>
<td>4 (4)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Mean seriousness of illness (SD)</td>
<td>3.6 (1.1)</td>
</tr>
<tr>
<td>Mean likelihood of returning to normal (SD)</td>
<td>4.3 (0.9)</td>
</tr>
<tr>
<td>Mean speed of returning to normal (SD)</td>
<td>3.7 (0.9)</td>
</tr>
</tbody>
</table>

Note: AD = advance directive; CES-D = Center for Epidemiological Studies–Depression Scale-10; DPAH = durable power of attorney for health care.

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hospitalization or in the months after hospitalization. The same pattern of means was seen on the total LSPQ score (prehospital $M = 2.21$, recovery $M = 1.98$, posthospital $M = 2.09$). Preferences for GBS and antibiotics showed no significant differences across interviews.

The analyses examining potential moderators of preference change showed no evidence that changes in desire for life-sustaining treatment across the interviews was affected by subjects’ perceptions of the seriousness of their illness, the length of their hospital stay, or the magnitude of changes in their depressive symptomatology, perceived general health, or bodily pain from prehospitalization to recovery.\(^{c}\)

**Stability of Want and Don’t-Want Responses across Interviews**

Table 2 presents the percentage of want and don’t-want responses changing and remaining stable between the prehospitalization and recovery interviews. As can be seen in that table, want treatment responses were considerably less stable than don’t-want treatment responses when responses were aggregated across all LSPQ items as well as for the CPR, ANH, and GBS items aggregated separately. Across all LSPQ responses, for example, 87% of responses indicating refusal of treatment prior to hospitalization remained stable at the recovery interview. In contrast, 43% of cases in which participants wanted to receive treatment prior to hospitalization changed to don’t-want treatment responses at the recovery interview (stability = 57%). Only antibiotic preferences did not show a similar pattern.

\(^{c}\) Two dichotomous variables, timing of subjects’ hospitalization (between the time 1 and 2 annual interviews or between the time 2 and 3 annual interviews) and whether or not the subject had an advance directive (either instructional or proxy), were also examined as potential moderators of preference change across the interviews. Significant Advance Directive × Interview interactions were found for the total Life-Support Preferences Questionnaire (LSPQ) index, $F(2, 152) = 3.65, P < 0.001$, and for the cardiopulmonary resuscitation (CPR), artificial nutrition and hydration (ANH), and antibiotics subscales, $Fs = 3.11, Ps < 0.05$. The pattern of these interactions, however, is difficult to interpret. For CPR and ANH preferences, both advance directive groups showed a tendency to want less treatment at the recovery interview compared to the annual interviews, quadratic contrast $Fs = 3.55, Ps < 0.07$. The interaction for these preferences seems to be a function of a tendency for subjects with an advance directive to show a smaller decrease in desire for treatment from the prehospitalization to the recovery interview, but a larger increase in desire for treatment from the recovery to the posthospitalization interview, than did individuals without an advance directive. The interaction pattern for antibiotic preferences was different. Subjects with an advance directive showed a significant linear decrease in desire for antibiotics over time, $F(1, 76) = 6.52, P < 0.01$, whereas subjects without an advance directive showed a nonsignificant trend ($P < 0.15$) in the other direction.

**Table 2** Stability of Want and Don’t-Want Treatment Responses between the Prehospitalization and Recovery Interviews

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Prehospital</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPR</td>
<td>Don’t want</td>
<td>225</td>
</tr>
<tr>
<td></td>
<td>Want</td>
<td>56</td>
</tr>
<tr>
<td>ANH</td>
<td>Don’t want</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Want</td>
<td>41</td>
</tr>
<tr>
<td>GBS</td>
<td>Don’t want</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>Want</td>
<td>51</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Don’t want</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Want</td>
<td>44</td>
</tr>
<tr>
<td>Total LSPQ</td>
<td>Don’t want</td>
<td>802</td>
</tr>
<tr>
<td></td>
<td>Want</td>
<td>192</td>
</tr>
</tbody>
</table>

Note: Units are responses rather than participants. ANH, artificial nutrition and hydration; CPR, cardiopulmonary resuscitation; GBS, gall bladder surgery; LSPQ, Life-Sustaining Treatment Preferences Questionnaire.

Because of our particular interest in the fate of responses changing from wanting treatment at the prehospitalization interview to refusing treatment at the recovery interview, Table 3 compares the recovery-to-post-hospitalization stability of these judgments to that of responses showing a consistent refusal of treatment in the first 2 interviews. Again considering responses aggregated across all LSPQ items, 90% of preferences showing a consistent pattern of treatment refusal from prehospitalization to recovery also remained stable from recovery to posthospitalization. In contrast, fully 50% of the responses showing a change from want to don’t-want treatment from prehospitalization to recovery shifted back to want treatment at the posthospitalization interview.

**Utility Loss**

In general, utility loss was modest (typically less than 1 unit) for both the preference-based and actuarial strategies across all treatments. Most important, however, the utility loss associated with using subjects’ prehospitalization preferences to predict their recovery preferences was generally very similar to the loss associated with the very simple actuarial strategy of predicting recovery preferences from the sample’s modal response. For example, the preference-based approach was actually a slightly (though not significantly) less accurate strategy (i.e., it produced more mean utility loss) than the actuarial approach for CPR (.55 v. .45) and ANH preferences (.42 v. .35) and for the index averaging across all 16 treatment preferences.
CONTEX CHANGES CHOICES

Table 3  Stability of Don’t-Want Treatment Responses between Recovery and Posthospitalization Interviews by Prehospitalization Treatment Preferences

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Prehospital to Recovery</th>
<th>Posthospital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Don’t Want → don’t want</td>
<td>Don’t Want</td>
</tr>
<tr>
<td>CPR</td>
<td></td>
<td>189</td>
</tr>
<tr>
<td>ANH</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>GBS</td>
<td></td>
<td>222</td>
</tr>
<tr>
<td>Antibiotics</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Total LSPQ</td>
<td></td>
<td>143</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23</td>
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<td></td>
<td></td>
<td>679</td>
</tr>
<tr>
<td></td>
<td></td>
<td>91</td>
</tr>
</tbody>
</table>

Note: Units are responses rather than participants. ANH, artificial nutrition and hydration; CPR, cardiopulmonary resuscitation; GBS, gall bladder surgery; LSPQ, Life-Sustaining Treatment Preferences Questionnaire.

(.67 v. .57). Only in the case of antibiotic preferences was the preference-based approach statistically superior to the actuarial one (.66 v. 1.07), $t(85) = 3.64$, $P < 0.001$.

DISCUSSION

This study used a prospective design to examine the life-sustaining treatment preferences of 88 older adults before hospitalization, during their recovery from the hospitalization, and several months after recovery. We found that treatment preferences elicited during recovery from an important, but not life-threatening, illness were different from those stated both prior to and months after hospitalization.

Specifically, subjects reported less desire for life-sustaining medical treatment during the recovery interview than they did during the annual interview conducted prior to their hospitalization. If we were to consider just these 2 data points, one plausible explanation would be that direct experience with the discomforts of hospitalization caused an enduring change in our subjects’ attitudes about the value of extending life via aggressive medical treatment. Following the lessons of Christensen-Szalanski’s study of anesthesia preferences, however, we continued to track our subjects’ treatment preferences in the months after their hospitalization. This follow-up measurement highlighted the temporary nature of preference changes observed in the immediate context of a medical event. Instead of hospitalization causing an enduring decline in subjects’ desire for life-sustaining treatment, patients’ change in preferences was shown to be fleeting, as preferences returned to near prehospitalization levels at the next regular annual interview (conducted at least 3 months after hospitalization). This pattern of contextual change is very similar to that found by both Christensen-Szalanski and in a recent study comparing perceptions of current and former colostomy patients.

Although a significant hospitalization dip was found on the overall index combining all 16 preference judgments, the effect was most pronounced in preferences for the most invasive treatments of CPR and ANH. These treatments are the focus of many end-of-life decisions, and at an intuitive level, they might seem to be the treatments about which people should have the most clear-cut and stable opinions. Thus, an important contribution of the current study is to document that preferences for these prototypical examples of life-sustaining treatment may be particularly dependent on the context in which they are elicited.

Further insight into the specific pattern of contextual change observed in the current study is revealed by examining the proportion of want and don’t-want treatment responses changing across the interviews. Consistent with the hospitalization dip pattern found in the primary analyses, instability in treatment preferences across interviews occurred primarily for individuals who initially indicated their desire to receive treatment at the prehospitalization interview. Taking CPR decisions as an example, whereas treatment refusal decisions remained highly stable across all 3 interviews, 56% of all decisions to receive CPR at the prehospitalization interview changed to decisions to refuse treatment at the recovery interview, and 56% of those initially unstable decisions changed back to wanting CPR by the time of the posthospitalization interview several months later. These findings suggest
that physicians and family makers should be sensitive to the possibility that decisions to receive life-sustaining treatment stated by healthy individuals may be particularly susceptible to contextual change and, more generally, that even the seemingly modest changes in preferences observed in analyses of the undichotomized scale responses can have clinically relevant implications. When faced with essentially a 50-50 chance that decisions expressed at any given time will change with changes in an individual’s health condition, the task of divining a patient’s “true” end-of-life wishes becomes difficult. The utility loss analyses confirm that, in the current study, using patients’ prehospitalization desire for life-sustaining treatment to predict their desire for the same treatments in the immediate aftermath of hospitalization was a no more accurate strategy than simply predicting recovery interview preferences from the most common preference stated by the sample.

**Strengths, Limitations, and Future Directions**

An important strength of this study was its prospective design. We elicited elderly subjects’ preferences for life-sustaining treatment in future hypothetical health states prior to an unplanned hospitalization, which then allowed us to compare these decisions to those made in the recovery period. Moreover, by collecting these prospective data in the context of a 2-year longitudinal study, we were able to interview patients again months after their hospitalization—data that yielded valuable information about the context dependency of patients’ treatment preferences.

One limitation of the study design was the lack of a no-hospitalization control group that was interviewed near the same time as our hospitalized sample. Although this would have been an ideal method of confirming the causal role of the hospitalization experience in our findings, the U-shaped pattern of preference change observed in the current study is not easily explained by the simple passage of time.

Another key limitation of the study is that we examined a small, relatively healthy sample of individuals, most of whom did not experience life-threatening illness. Smaller than ideal samples are a common affliction of prospective studies. Prospective studies also, by definition, examine only a select and potentially unique subgroup of the larger study sample. The current study was generally quite successful, however, in that we were able to use more than 20% of the total ADVANCE sample due to the substantial rate of hospitalization in older adults. Moreover, a compelling argument can be made that finding significant preference change after relatively minor hospitalization experiences does not bode well for the stability of treatment preferences in the face of more serious illness or injury.

Still, it would be valuable for future research to replicate the current findings in a sample of individuals confronted with more serious illness for 2 general reasons. First, studying individuals experiencing and then recovering from serious illness would help to better address questions about the psychological mechanisms underlying contextual changes in treatment preferences. In addition to documenting preference changes associated with hospitalization, a second goal of the current study was to begin to specify why such preference changes might occur. We collected data about subjects’ physical and psychological states that might be expected to change with hospitalization and thus might account for changes in life-sustaining treatment choices. The reported moderator analyses were intended to address such issues in that if, for example, the dip in desire for treatment was most pronounced for those individuals showing the largest increases in depressive symptoms from prehospitalization to recovery, then a key role for depression in preference change would be suggested. None of the health state factors we examined, however, were significant moderators of preference change. One likely contributor to the inconclusiveness of these analyses was that the health state factors themselves showed relatively little change across interviews. In a sample of individuals facing hospitalization for more serious health conditions, more dramatic changes in health state would be expected, and these changes would greatly facilitate identification of moderating (or even mediating) variables.

The first reason for examining treatment preference change in individuals facing serious illness, therefore, is because the magnitude of effects may be greater than in individuals facing less serious health threats. The second reason is that the pattern of effects may differ as well. In the current study, hospitalization was associated with a decreased desire for life-sustaining medical treatment. Consider, however, the common intuitive example of the individual who steadfastly asserts his or her wish to forgo heroic medical treatment while healthy but becomes more aggressive about life-prolonging treatment once faced with the genuine possibility of death. A more theoretically sophisticated version of this pattern is consistent with research showing an impact bias in affective forecasting. That is, a number of studies have shown that individuals tend to overestimate both the magnitude and duration of their affective reactions to future life events. This impact bias would predict that
healthy individuals should tend to underestimate their interest in receiving life-sustaining treatment in terminal illness situations (believing that they would respond more poorly to the illness than they would in actuality). No data currently exist to confirm whether this pattern of preference change, or the one found in the current study, best characterizes how preferences for life-sustaining treatment made by healthy individuals might change in response to a real end-of-life scenario. As noted earlier, an ideal test examining whether life-sustaining treatment preferences remain stable into periods of incapacitating illness (the time when treatment instructions in advance directives would be consulted) is not possible. Still, the more closely researchers can approximate this ideal by studying samples of individuals experiencing and then recovering from serious illness, the more valid (and specific) are the conclusions that can be drawn. The growing body of theoretical work regarding people’s ability to predict their future feelings and choices can be drawn upon to refine predictions of how hypothetical and “real” health decisions might be expected to diverge for different medical conditions and in varying decision contexts.

Conclusions

The current study is the latest addition to expanding bodies of research questioning 1) the stability of life-sustaining treatment preferences over time and across changes in an individual’s health condition and 2) the general ability of individuals to predict accurately their future feelings and behavioral choices. As a whole, this work presents a formidable empirical challenge to the almost universal advocacy of instructional advance directives found in modern American medicine. If treatment preferences made by healthy individuals cannot be taken as accurate representations of the treatment choices those individuals would make in actual end-of-life scenarios, then the value of documenting life-sustaining treatment preferences in instructional advance directives is suspect.

At first blush, this statement might be taken as an endorsement of the idea that the treatment preferences of seriously ill individuals should be given priority over preferences expressed by healthy individuals imagining (presumably in good faith and with due consideration) their future illness. To the contrary, however, the assumption that choices made in the throes of serious illness are somehow “better” (i.e., more authentic) than decisions made by healthy individuals in the calm detachment of hypothetical consideration can be questioned from many angles. In many judgment situations, this valuation would be reversed, and emotional detachment would be seen as preferable to emotional involvement as a context for optimal decision making.

As empiricists, the goal of psychologists and decision scientists is to pursue a more sophisticated understanding of how preferences for life-sustaining treatment are affected by changes in an individual’s physical and emotional state and to document the conditions under which treatment preferences stated by healthy and ill people are likely to differ. This empirical understanding can only be translated into clear policy guidance, however, if it then serves as input into an equally sophisticated ethical analysis regarding how to assign value to decisions made within the different contexts provided by health and illness.

REFERENCES