Can Goal-Based Advance Planning Guide Medical Care in the Nursing Home?

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Objective: To determine whether a goal-based system of advance planning, which allows patients to choose among five “pathways of care” (longevity, ameliorative/comprehensive, ameliorative/basic, palliative/comfort, or palliative/hospice), enables physicians to select treatment options in specified clinical situations.

Design: A pencil and paper test was administered in which clinicians were presented five common clinical scenarios and were asked which of four possible treatment options they would recommend, given a predetermined “pathway of care.”

Setting: A 725-bed teaching nursing home and affiliated continuing care retirement community.

Advance medical planning has been widely advocated as a means for preserving patient autonomy in care near the end of life.1 Advance directives are the major way in which such planning has been undertaken, but these documents have been criticized for being either excessively vague or unduly intervention-specific.2 In addition, they typically fail to address the patient’s goals of care.3 They do not take into consideration that medical interventions are a means to an end and may serve different purposes in different situations.

A system of goal-based advance medical planning has been developed for use in a long-term care facility.4 In this approach, the physician asks patients to prioritize their goals for medical treatment and then assigns a “pathway of care” based on the patient’s ranking of three goals: life prolongation, maintenance of function, and maximization of comfort. The designated pathway—longevity, ameliorative/comprehensive, ameliorative/basic, palliative/comfort or palliative/hospice—then serves as a guide for choosing what interventions to undertake in the setting of acute illness.

The pathways system was previously pilot tested on a nursing unit of a teaching nursing home, demonstrating that it is possible for residents or their surrogates to prioritize goals and for the medical team to recommend a pathway based on those goals.5 The next step in evaluating the usefulness of such a system is to determine whether goal-based advance medical planning can guide treatment choices. This study sought to answer whether clinicians agree on treatment once a pathway has been selected.

METHODS

The pathways approach was described to the staff of a 725-bed teaching nursing home and its affiliated continuing care retirement community. The clinicians were given a one-page document summarizing, for each pathway, the underly-
ing goals and the types of treatment consistent with that approach (Table 1). A scenario-based pencil and paper test was then administered in a proctored setting to measure the usefulness of the pathways system in guiding medical decision making in the nursing home. Five hypothetical scenarios were presented: acute gastrointestinal bleeding, pneumonia, dehydration, acute myocardial infarction, and new stroke. For each scenario, the clinician was offered four possible courses of action and asked which he or she would select for each of two designated pathways (see Appendix). Correct answers were determined by comparison to a reference standard provided by the designer of the pathways system.

Data were collected on possible determinants of physician/nurse practitioner performance, including profession, prior exposure to the pathways system, and length of employment at the facility.

### Study Population

The study population was made up of 21 members of the medical staff at the Hebrew Rehabilitation Center for Aged in Boston, Massachusetts. The staff includes 19 physicians and 3 nurse practitioners (one physician who designed the pathway system and the test was excluded).

### Results

Of the 21 tests distributed, 17 tests (81%) were completed. Two tests had to be discarded because the subjects did not fill out the answer sheet correctly: the respondents were asked which of four possible treatments they would recommend given a particular pathway but two respondents instead indicated which pathway corresponded to each treatment option listed. Overall, 78% of the answers were correct based on the reference answers, with individual scores ranging from 60% to 100%. When specific pathways were examined (Table 2), the highest proportion of correct answers was found for the ameliorative/comprehensive and palliative/hospice pathways, with scores of 86.7% and 100% respectively. The palliative/comfort pathway had the lowest rate of correct answers, with only 50% of the responses coinciding with the reference.

When the tests were studied by scenario (Table 3), treatment choices were most consistent for the case of pneumonia, with 96.7% of the respondents choosing the correct answer. Treatment choices were most variable for the scenario involving an acute gastrointestinal bleed, where only 63.3% of the respondents agreed with the reference answer. The remaining three clinical scenarios had similar rates of correct answers (73.3% for the dehydration scenario, 76.7% for the myocardial infarction scenario, and 80.0% for the longevous pathway scenario).

### Analysis

Descriptive statistics were calculated. The answers from each test were recorded and the proportion of correct answers (by comparison with the reference answers) was computed, as well as the proportion of correct answers for each clinician. Test results were also analyzed by pathway to determine whether certain pathways more clearly implied treatment choices, and by scenario to determine whether the approach in particular clinical situations was more uniform than in others. The percent of answers that were the same as the reference standard was measured. Statistical significance was determined by computing $p^* = \frac{1}{\sqrt{np(1-p)n}}$ where $p^*$ is the proportion of correct answers and $P = 0.25$, the probability of any given answer expected by chance, and comparing the result to a critical value in a z-score distribution table. The possible answers to each question were ranked ordered by aggressivity, with 1 the least aggressive intervention and 4 the most aggressive. To determine the variability among the responses to each question, the standard deviation was computed.

### Table 1. Pathways of Care Document

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>LONGEVOUS PATHWAY</strong></td>
<td>Primary goal is longevity, second goal maintenance of function, third goal comfort. No limits to care. Includes CPR, ICU, respirator.</td>
</tr>
<tr>
<td><strong>AMELIORATIVE PATHWAY</strong></td>
<td>Primary goal is maintaining physical and mental function.</td>
</tr>
<tr>
<td><strong>PALLIATIVE PATHWAY</strong></td>
<td>Primary goal is maximizing comfort.</td>
</tr>
<tr>
<td><strong>Subtype: Comprehensive Pathway</strong></td>
<td>Primary goal is maintenance of function, second goal is life-prolongation, third goal is comfort. Limits to care: attempted CPR, ICU care, intubation.</td>
</tr>
<tr>
<td><strong>Subtype: Basic Pathway</strong></td>
<td>Primary goal is maintenance of function, second goal is comfort, third goal is life-prolongation. Limits to care: attempted CPR, ICU, intubation. Hospitalization only when no potentially effective treatment available at the nursing home.</td>
</tr>
<tr>
<td><strong>Subtype: Comfort Pathway</strong></td>
<td>Primary goal is maximizing comfort; second goal is maintaining function, third goal is life-prolongation. Limits to care: CPR, ICU, intubation, hospitalization. Generally would not use intravenous therapy or feeding tubes.</td>
</tr>
<tr>
<td><strong>Subtype: Hospice Pathway</strong></td>
<td>Sole goal is comfort; longevity, function no longer an issue. Limits to care: CPR, ICU, intubation, hospitalization, iv, feeding tubes, curative therapy.</td>
</tr>
</tbody>
</table>

### Table 2. Correct Answers by Pathway

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Number (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longevous</td>
<td>24 (80.0)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ameliorative/comprehensive</td>
<td>26 (86.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Ameliorative/basic</td>
<td>22 (73.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Palliative/comfort</td>
<td>15 (50.0)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Palliative/hospice</td>
<td>30 (100.0)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
dial infarction scenario, and 80.0% for the acute stroke scenario).

When variability among the answers to each question was measured to determine whether the pathways narrowed the range of plausible approaches to treatment, rank ordering treatment options by level of aggressivity, the standard deviation was low (0 to 0.83) in all except two cases. For the case of dehydration in a patient choosing the comfort pathway and for the case of stroke in a patient choosing the longevous pathway, the standard deviations were 1.06 and 1.01 respectively.

There was insufficient power to detect an association between the demographic variables analyzed—profession, previous exposure to the pathways system, or duration of employment—and the distribution of responses. All those tested indicated they found the “pathways to care” potentially useful to guide decision making.

DISCUSSION

Previous studies have indicated that neither very general advance directives nor designation of a single overriding goal can reliably be used to infer preferences for specific treatments. We hypothesized that knowledge of a patient’s chosen “pathway of care” based on the prioritization of three distinct goals of care would enable clinicians to recommend treatment options in the setting of acute illness. Our results suggest that although the pathway system does not lead to the determination of a unique “right answer” to the question of how to proceed in the event of serious illness, it narrows the range of possibilities.

In certain clinical conditions, providers are in substantial agreement as to how to implement the “pathway”; other situations create greater ambiguity. For the two questions about the patient with pneumonia, 96.7% of the respondents indicated that the “ameliorative/basic” pathway implied treatment at the nursing home using intravenous antibiotics and oxygen, and 100% indicated that the “palliative/hospice” pathway implied treatment at the nursing home using oxygen, acetaminophen, and morphine. By contrast, for the questions about the patient with a gastrointestinal bleed, only 63.3% of respondents felt that the “palliative/comfort” pathway implied treatment at the nursing home with a proton pump inhibitor and discontinuation of anticoagulation, and 80% of respondents felt that the “ameliorative/comprehensive” pathway was most consistent with treatment in the hospital on a general medical floor. Some clinical situations may be inherently less clear-cut, or the alternative treatments listed on the test may have included fewer plausible options for some of the questions.

Certain pathways guide treatment choices more clearly than others. For example, the questions involving the “palliative/hospice” pathway yielded the correct response in 100% of the respondents, whereas the “palliative/comfort” pathway yielded the right choice in only 50% of cases. This finding suggests that the latter pathway may need to be defined more clearly or eliminated from the array of choices.

Our study has many limitations. It was conducted at a single facility, making it difficult to generalize results to medical practices at other long-term care institutions. In addition, the results are based on the tests of only 15 practitioners. Because a brief test was administered in the hope of maximizing completion, there were only two questions about each of five clinical scenarios, and each of the five pathways was listed as the patient’s choice in only two questions. Our test of utility was based on a written test in which suggested possible treatments were listed, not on actual practice, where the options are open-ended. It is conceivable that clinicians who found the pathway a useful guide in this exercise would not be able to apply the pathway in real clinical situations. The choice of a written test was based on the assumption that if the pathways were not useful in this highly artificial setting, they would surely not be useful in actual practice.

The test did not answer the question of whether the treatment recommended by the physician when he was aware of the pathway differed from what he would have suggested without knowing the patient’s preferences. Our assumption is that any of the four treatment choices offered would have been reasonable, depending on the patient’s wishes. Good medical practice demands that physicians take into consideration patients’ values. Our preliminary results suggest cautious optimism by indicating that a goal-based system of pathways of care may help clinicians educated in the system determine the upper and lower bounds of care.

If the purpose of advance medical planning is to lay the groundwork for discussions about treatment,9 discussions that will occur when a problem arises rather than just in a theoretical context, then the pathways approach may be extremely useful. Although it does not specify precisely what treatment should be undertaken in any clinical situation—it does not have the simplicity and clarity of a “do not resuscitate” order—the pathways system narrows the range of options and gives the practitioner a basis for a conversation with the resident or proxy about choices. It allows the nursing home physician or nurse practitioner to describe the acute medical problem and then recommend a course of action based on previous discussions about the goals of care. Two choices might be presented if there was uncertainty about how best to translate the pathway into practice and if the final decision required further assessment of the burdens and benefits of treatment by the patient or proxy.

For the pathway system to be more widely implemented,
clinicians will require greater education in the meaning and use of the pathways than was provided by a brief presentation and written summary. Variants on the system described here should be tested, and the pathways should be tried out in community nursing homes that do not have a closed medical staff. The challenge is to find a way to talk with patients and families about how much medical care and what kind of care they prefer, and a goal-based discussion may prove to be a helpful way to frame the issues.\textsuperscript{10}

**ACKNOWLEDGMENTS**

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**REFERENCES**


**APPENDIX**

**TEST OF SYSTEM OF “PATHWAYS TO CARE”**

**(Sample Question)**

The goal of this questionnaire is to determine whether knowledge of a patient’s chosen “pathway to care” is useful in making clinical decisions. You will be presented with a series of cases and then asked which of several alternative treatment plans you would have suggested, given that the patient had indicated a particular approach to care.

2. S.D. is an 89-year-old male nursing home resident with Parkinson’s disease and moderately severe dementia. He has a history of sick sinus syndrome, leading to pacemaker placement. Over the past several months he has repeatedly aspirated. You come to see him because he is febrile to 101 and sounds congested. On examination, he is barely arousable but appears comfortable. His temperature is 101 rectally, his pulse is 60, his RR is 24, and his BP is 120/60. He is not cyanotic. His lungs show rhonchi at both bases. There is no JVD or peripheral edema. Choose from among the following therapeutic options:

   a. Treat at the nursing home with intramuscular antibiotics, clysis, and oxygen.
   b. Transfer to the hospital, and discuss with the geriatrics attending/fellow that he should be treated on a general medical floor as he is not a candidate for intubation or vasopressors.
   c. Treat at the nursing home with oxygen, acetaminophen, and morphine.
   d. Treat at the nursing home with intravenous antibiotics and oxygen, after drawing electrolytes, complete blood count, and blood cultures.

Recommended course of action if pathway is Ameliorative/basic: __________
Recommended course of action if pathway is Palliative/hospice: __________