Reported pain increased for the 1677 intervention patients and surrogates interviewed in the second week, compared with the control group (adjusted ratio, 1.15; 95% CI, 1.09 to 1.22) (Table 3). There was no change in hospital resources used for 2569 intervention patients not dead or discharged before the third study day compared with 2120 control patients (adjusted ratio of average resource use, 1.05; 95% CI, 0.99 to 1.12).

The unadjusted differences between intervention and control patients for median days until the first DNR order was written were large, especially for patients with colon cancer and non-small cell lung cancer for whom the median number of days until a written DNR order was 80% lower in intervention patients. Adjustment for baseline imbalances reduced much of the difference in each category (Table 3). The differences that persist in the cancer category are of uncertain importance, being one among multiple comparisons and being based on a small number of patients (Table 3).

Figure 2 illustrates the secular trends of each outcome in the phase II intervention and control groups, as well as in phase I, using simulations of the physician specialty groupings used in phase II. None of the five outcomes changed significantly during the 5 years of the study. The differences between those two groups who would have been assigned to intervention and control in phase I persisted throughout the SUPPORT study, unaffected by time or by the intervention.

Communication and Preferences

The intervention did not change the unadjusted proportion of patients or surrogates reporting a discussion about CPR: 84% of control patients and 80% of intervention patients reported discussing their preferences. Of patients who did not have such a discussion, 41% of each group said they would like to discuss CPR. Seventeen percent of control patients and 23% of intervention patients changed their resuscitation preferences to forgo CPR by the second week after enrollment, and 36% of control patients and 41% of intervention patients reported having a discussion about their prognosis with a physician. Of those who did not discuss their prognosis, 44% of control patients and 42% of intervention patients reported that they would like to have such a discussion.

Physicians' Perspective on Intervention

In the second physician interview, 59% acknowledged receiving the prognostic reports and 54% acknowledged receiving the preference reports. Fifteen percent reported discussing this specific information with patients or families. Nearly a quarter of respondents (22%) said that they thought the SUPPORT nurses' involvement improved patient care.

Safety Monitoring

After adjusting for baseline differences, the 6-month mortality for phase II control patients was the same as for intervention patients (adjusted relative hazard, 0.95; 95% CI, 0.97 to 1.03). Both control (89%) and intervention (86%) patients or surrogates rated their care as excellent or very good.

COMMENT

Findings from phase I of SUPPORT documented many shortcomings of care. The SUPPORT patients were all seriously ill, and their dying proved to be predictable, yet discussions and decisions substantially in advance of death were uncommon. Nearly half of all DNR orders were written in the last 2 days of life. The final hospitalization for half of patients included more than 8 days in generally undesirable states: an ICU, receiving mechanical ventilation, or coma. Families reported that half of the patients who were able to communicate in their last few days spent most of the time in moderate or severe pain. Based on a study in a defined population in our Wisconsin site, we estimate that patients meeting SUPPORT criteria account for approximately 400,000 admissions per year in the United States and that another 250,000 people are similarly ill but would not meet SUPPORT criteria. Surveillance systems of being hospitalized or in intensive care. Patients with SUPPORT illnesses and severity scores accounted for about 40% of persons dying in the defined population.
Table 4.—Effect of the SUPPORT Intervention on Five Outcomes Within the Major Disease Categories

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted Outcomes</th>
<th>Adjusted Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acute Respiratory</td>
<td>Acute Exacerbation</td>
</tr>
<tr>
<td></td>
<td>Failure of COPD, or</td>
<td>of COPD, or Chronic</td>
</tr>
<tr>
<td></td>
<td>CHF or COPD, or CHF</td>
<td>CHF or COPD, or CHF</td>
</tr>
<tr>
<td></td>
<td>Coma</td>
<td>Coma</td>
</tr>
<tr>
<td></td>
<td>Advanced Lymphoma</td>
<td>Advanced Lymphoma</td>
</tr>
<tr>
<td></td>
<td>Cancer</td>
<td>Cancer</td>
</tr>
<tr>
<td><strong>Median time until DNR order was written, d</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td>Intervention</td>
<td>34</td>
<td>43</td>
</tr>
<tr>
<td><strong>DNR agreement, %</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Intervention</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td><strong>Uninterrupted state, median d</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>10</td>
<td>9.5</td>
</tr>
<tr>
<td>Intervention</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td><strong>Pain, %</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Intervention</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td><strong>Resource use, median 1993 dollars</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>34,800</td>
<td>9,000</td>
</tr>
<tr>
<td>Intervention</td>
<td>30,300</td>
<td>8,100</td>
</tr>
</tbody>
</table>

*SUPPORT indicates Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments; COPD, chronic obstructive pulmonary disease; CHF, congestive heart failure; DNR, do not resuscitate.

Building on the findings in phase I, observations of others,4,5,14-16 the opinions of physicians at the five sites, and the marked variation in their baseline practices, the phase II intervention aimed to make it easier to achieve better decision making for these seriously ill patients. The intervention gave physicians reliable prognostic information and timely reports of patient and surrogate perceptions, two most important factors cited recently by physicians when considering life-support decisions for critically ill patients.4,14-16 The intervention nurse also undertook time-consuming discussions, arranged meetings, provided information, supplied forms, and did anything else to encourage the patient and family to engage in an informed and collaborative decision-making process with a well-informed physician (Table 1).

The intervention was limited by its application to a diverse group of physicians and patients, all of whom had to comply voluntarily. The intervention had to be perceived as helpful, polite, and appropriate. As an initial attempt to change outcomes for seriously ill patients, we did not seek authority to be coercive or more than minimally disruptive. As designed, however, the intervention was vigorously applied. The SUPPORT nurses were committed, energetic, and trained. They engaged in the care of virtually all our patients, and nearly everyone had printed reports delivered promptly.

Because we thought that changes in the decision-making processes that were not reflected in improved patient outcomes would not be worth much expense, we specified five outcomes, each indicating an important improvement in patient experience, as the main targets of the intervention.

The intervention had no impact on any of these designated targets (Tables 3 and 4). Furthermore, even though the targeted outcomes are objectives of much ethical and legal writing and of some explicit social policy (such as informed consent statutes, the Patient Self-determination Act, and guidelines on pain),4-5,14-16 there were no secular trends toward improvement for intervention or control patients during the 5 years of SUPPORT data collection (Figure 2).

These results raise fundamental questions about the intent and design of this study. Do patients and physicians see the documented shortcomings as troubling? Can enhanced decision making improve the experience of seriously ill and dying patients? Were the inevitable limitations of this project too great to draw strong conclusions?

Because there was no movement toward what would seem to be better practices, one could conclude that physicians, patients, and families are fairly comfortable with the current situation. Certainly, most patients and families indicated they were satisfied, no matter what happened to them. Physicians have their established patterns of care, and while they were willing to have the SUPPORT nurse present and carrying on conversations, physician behavior appeared unchanged. Perhaps physicians and patients in this study acknowledged problems with the care of seriously ill patients as a group. However, when involved with their own situation or engaged in the care of their individual patients, they felt they were doing the best they could, were satisfied they were doing well, and did not wish to directly confront problems or face choices.4-5,14-16

The study certainly casts a pall over any claim that, if the health care system is given additional resources for collaborative decision making in the form of skilled professional time, improvements will occur. In phase II of SUPPORT, improved information, enhanced conversation, and an explicit effort to encourage use of outcome data and preferences in decision making were completely ineffectual, despite the fact that the study had enough power to detect small effects.

It is possible that the intervention would have been more effective if implemented in different settings, earlier in the course of illness, or with physician leaders rather than nurses as implementers. Perhaps, it would have been effective if continued for more time or tested at later end points.4-5,14-16 However, over-all results of this study are not encouraging. No pattern emerged that implied that the intervention was successful for some set of patients or physicians or that its impact increased over time. The five hospitals had been chosen for their diversity and willingness to undertake a substantial and controversial challenge. Yet none showed a tendency toward improvement in these outcomes.

SUPPORT did demonstrate, however, that issues this complex can be studied with sufficient scientific rigor to be confident of the findings. We achieved good interview response rates among seriously ill patients, their families, and physicians, widespread acceptance of the intervention in diverse hospitals, and high-quality data. Consent and confidentiality issues were complex but assessable to solution. The analytic issues required application of relatively novel approaches, but they proved effective. The study also demonstrated the need for such methods...
when performing evaluations of complex interventions in seriously ill patients. We would have concluded that the intervention positively influenced all outcomes if we had not had phase I results for baseline adjustment and phase II control patients to evaluate secular trends (Table 4 and Figure 2).

In conclusion, we are left with a troubling situation. The picture we describe of the care of seriously ill or dying persons is not attractive. One would certainly prefer to envision that, when confronted with life-threatening illness, the patient and family would be included in discussions, realistic estimates of outcome would be valued, pain would be treated, and dying would not be prolonge. That is still a worthy vision. However, it is not likely to be achieved through an intervention such as that implemented by SUPPORT. Success will require reexamination of our individual and collective commitment to these goals, more creative efforts at shaping the treatment process, and, perhaps, more proactive and forceful attempts at change.

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