Medical Specialists Prefer to Withdraw Familiar Technologies When Discontinuing Life Support

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OBJECTIVE: **To assess how members of different specialties vary in their decisions about which form of life support to withdraw. The hypothesis was that each specialty would be more comfortable withdrawing its "own" form of life support relative to other forms and other specialties.**

DESIGN: **Mail survey.**

SETTING: **24 medical centers.**

PARTICIPANTS: **225 specialists in six specialties and 225 comparison physicians randomly matched according to percentage of time devoted to clinical practice.**

MEASUREMENTS: **The six specialties were linked with six life-sustaining technologies related to their special expertise: 1) pulmonologists with mechanical ventilation, 2) nephrologists with hemodialysis, 3) gastroenterologists with tube feedings, 4) hematologists with blood products, 5) cardiologists with intravenous vasopressors, and 6) infectious disease specialists with antibiotics. The subjects ranked different forms of life support in the order in which they would prefer to withdraw them. They also expressed their preferences in response to hypothetical clinical vignettes.**

RESULTS: **In five of the six specialties, the specialists had a relative preference for withdrawing their "own" form of life support, compared with the preferences of the comparison physicians. Overall, the physicians tended to prefer withdrawing a form of life support closely linked with their own specialty.**

CONCLUSIONS: **Just as some specialist physicians tend to reach for different technologies first in treating patients, they also tend to reach for different technologies first when ceasing treatment. Specialists' preferences for different ways to withdraw life support not only may reflect a special understanding of the limits of certain technologies, but also may reveal how ingrained are physicians' patterns of practice.**

KEY WORDS: **critical care; decision making; life support care; ethics; decision theory; euthanasia; health policy; judgment; social factors; specialty.**

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Many clinicians are fond of quoting the aphorism, "If you go to a barber, don't be surprised if you get a haircut." The expression captures the expectation that patients referred to specialists often receive a procedure the specialists commonly perform. So, patients referred to hematologists get bone marrow biopsies; patients referred to pulmonologists get bronchoscopies; patients referred to gastroenterologists get endoscopies; and so on. The best explanation for this phenomenon may be that in many cases the indication for the procedure is what prompts the referral in the first place. An additional explanation is that clinicians get comfortable with the performance and interpretation of certain procedures and may begin to rely on them as general methods to assess patients. Both of these reasons reflect the underlying notion that specialists in a given discipline, when compared with other physicians, are in a position to know the most about the application of technologies closely linked to their specialty.

We wondered whether specialty differences might operate in the opposite direction when physicians consider the *withdrawal* of life-sustaining medical technologies. Might physicians who have special expertise in certain technologies be more likely to withdraw them in the face of alternative choices? For example, might pulmonologists, when compared with other physicians, be more likely to withdraw mechanical ventilation as opposed to other forms of life support? Or might nephrologists be more likely to withdraw hemodialysis? We hypothesized that specialists would be more comfortable withdrawing their "own" form of life support, compared with the preferences of other physicians, because they would know more about it and better understand its limitations. To test our hypothesis, we studied the preferences expressed by 450 physicians in response to certain hypothetical clinical tasks.

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METHODS

Subjects

We used data collected in a mail survey of a large group of internists representing many specialties. We considered six specialties and six "linked" life-sustaining technologies in which physicians in these specialties were expected to have special expertise: 1) pulmonologists and mechanical ventilation, 2) nephrologists and hemodialysis, 3) gastroenterologists and tube feedings, 4) hematologists and blood products, 5) cardiologists and intravenous vasopressors, and 6) infectious disease specialists and antibiotics.

We drew our sample from the 862 residents, fellows, and attending physicians affiliated with the Department of Medicine at the University of Pennsylvania. A detailed discussion of the methods of this survey has been reported elsewhere.[1,2] Of the 862 physicians surveyed, 485 (56%) responded. To evaluate our hypothesis, we used a subset of these data consisting of all 225 members of the six specialties of interest, along with 225 comparison physicians chosen as outlined below.

Survey Instrument

The physicians were asked to rank eight different forms of life support in the order in which they would prefer to withdraw them, all else being equal; the form most preferred for withdrawal was assigned a rank of 1 and that least preferred was assigned a rank of 8. In addition to the six forms of life support linked to the six specialties outlined above, the respondents were also asked to rank intravenous fluids and total parenteral nutrition, but these latter two technologies were not considered in the current analysis because they are not linked to any particular specialty in internal medicine.

Two pairs of specialties were investigated further by asking the subjects to respond to two clinical vignettes. One vignette—used to compare preferences between cardiologists and pulmonologists—described a comatose 66-year-old patient with chronic obstructive pulmonary disease and pneumonia who required intravenous vasopressors and mechanical ventilation. The patient had previously made it clear to his family and physician that he would want life support withdrawn under these circumstances. The physicians were asked to report their preferences for withdrawing either intravenous vasopressors or mechanical ventilation on a five-point Likert-type scale. Responses closer to 1 suggested a preference for withdrawing vasopressors and those closer to 5 suggested a preference for withdrawing mechanical ventilation.

The second vignette—used to compare nephrologists and pulmonologists—described a comatose 63-year-old patient with renal failure and myocardial infarction who required hemodialysis and mechanical ventilation. As in the first vignette, the patient had previously expressed interest in having life support withdrawn under these circumstances. The physicians were asked to report their preferences for withdrawing either hemodialysis or mechanical ventilation, again using a five-point scale. Responses closer to 1 suggested a preference for withdrawing dialysis and those closer to 5 suggested a preference for withdrawing mechanical ventilation.

Finally, the physicians provided demographic and professional information such as age, gender, religion, specialty, and percentage of time devoted to clinical practice.

Analysis

Our sample consisted of 225 specialists (attendings and fellows) in the six specialties: 71 cardiologists, 29 gastroenterologists, 37 hematologists, 20 infectious diseases specialists, 35 nephrologists, and 33 pulmonologists. Each specialist was randomly matched to a comparison physician (selected from a pool of 260 candidates) who reported the same percentage of time devoted to clinical practice and who was not a member of any of the six specialties of interest.[3] The comparison physicians were, for example, general internists, allergists, endocrinologists, rheumatologists, geriatricians, and emergency physicians. For each pair of matched physicians, the difference in ranks assigned to the linked form of life support was determined. Thus, a pulmonologist ranking mechanical ventilation as 1 who was randomly matched with a comparison physician ranking mechanical ventilation as 4 contributed a matched pair to our analysis with a difference in assigned ranks of 3. Under the null hypothesis of no difference in preference for linked technologies, the mean of the difference in ranks assigned between all the pairs of specialists and comparison physicians should be zero. This hypothesis was evaluated using a paired sample t-test, a conservative test of our hypothesis in this setting.

RESULTS

The specialist physicians did not differ statistically from the comparison physicians in terms of age, religion, or percentage of time devoted to clinical practice. In addition, each of the six specialties did not differ from the other specialties in terms of age, religion, or percentage of time in clinical practice. However, women were slightly better represented among the comparison physicians than among the specialist physicians (26% vs 15%, $p < 0.05$), a reflection of the difference in proportions of women in specialist vs generalist practice in the population of physicians as a whole.

Table 1 reports the mean rank assigned to the linked form of life support by members of each of the six specialties and, for comparison, the mean rank assigned by members of the matched comparison groups for each specialty. In each of the six specialties, except for infectious diseases, the specialists were more likely to prefer

Table 1
Mean Rank Assigned by the 225 Specialists and 225 Comparison Physicians to Six Linked Life Support Technologies, by Specialty*

Specialty and Linked Life Support Technology	Mean Rank Assigned by Specialist Physicians	Mean Rank Assigned by Comparison Physicians	Mean Difference in Rank for Matched Pairs
Pulmonologists: mechanical ventilation (n = 33)	4.35	5.26	0.91
Gastroenterologists: tube feedings (n = 29)	5.21	5.93	0.72
Cardiologists: intravenous vasopressors (n = 71)	3.63	4.12	0.49
Nephrologists: hemodialysis (n = 35)	3.13	3.40	0.37
Hematologists: blood products (n = 37)	3.12	3.39	0.27
Infectious disease specialists: intravenous antibiotics (n = 20)	4.63	4.45	−0.18

*Lower numbers indicate a greater preference for withdrawing the form of life support. A test of the hypothesis that members of the six specialties (the case physicians) differed from their matched comparison physicians in the rank assigned to the linked life support technology was significant ($t = 2.59$, $df = 224$, $p < 0.01$).

withdrawing the associated form of life support than were the matched comparison physicians. The mean of the difference in rank assigned by all the pairs of specialists and comparison physicians to the corresponding linked form of life support was 0.45; the test assessing the hypothesis that this number is significantly different from zero was significant ($t = 2.61$, $df = 224$, $p < 0.01$), thus rejecting the hypothesis that the specialists and the comparison physicians ranked the linked technology the same.

Responses to the vignettes also tended to support our hypothesis. In response to the first vignette, the 71 cardiologists and the 33 pulmonologists provided mean ratings of 1.88 ± 1.09 and 2.50 ± 1.19, respectively, suggesting that cardiologists have a relative preference for withdrawing intravenous vasopressors and, compared with cardiologists, pulmonologists have a relative preference for withdrawing mechanical ventilation ($t = 2.54$, $p < 0.01$). In response to the second vignette, the 35 nephrologists and the 33 pulmonologists provided mean ratings of 2.12 ± 1.17 and 2.45 ± 1.00, respectively. Though this difference was consistent with our hypothesis and suggests that nephrologists have a relative preference for withdrawing hemodialysis and pulmonologists, mechanical ventilation, it did not reach statistical significance at the 0.05 level ($t = 1.26$, $p = 0.21$).

DISCUSSION

A previous study of the withdrawal of life support in intensive care units (ICUs) has documented that more than 50% of ICU deaths occur following the withdrawal or withholding of life support.[4] Prior studies have examined *patient* characteristics that influence whether physicians choose to withdraw life support, such as age, quality of life, diagnosis, disease acuity, social role, neurologic status, and prognosis.[4–8] And prior work has examined *physician* characteristics that influence whether physicians choose to withdraw life support.[1, 2, 9–12]

Once the decision has been made to withdraw life support, however, it is the physician who usually decides which *form* of life support to withdraw, and it is reasonable to expect physician attributes to be important in this decision. Some previous work has considered how physician biases[1] or attributes of life support technologies[13, 14] influence physicians' decisions regarding the withdrawal of different forms of life support. To our knowledge, however, previous research has not focused on the impact of physician specialty on decisions about the form of life support to withdraw.

Among the physicians we surveyed, our results suggest that specialists favor limiting those technologies closely linked with their specialty when withdrawing life support. There are several possible explanations for this finding. First, our subjects may prefer to make judgments within their own area of expertise. Second, the specialists may believe that they have a special authority over their own domain and that to withdraw a form of life support in another specialty's domain may be an infringement of authority. Third, the specialist physicians we surveyed may overestimate the importance of their "own" organ system in maintaining life: if the goal of withdrawing life support is to allow the patient to die, it makes sense to withdraw that form of life support believed to be relatively more important. Each of these explanations might enhance physicians' preferences for withdrawing forms of life support linked to their specialty, relative to forms of life support linked to other specialties. Even so, we cannot tell whether these explanations underlie our findings.

Moreover, the findings reported here do not assess the degree to which physicians tend to agree, regardless of specialty, on their preferences for withdrawing different forms of life support. Indeed, the physicians we studied tended overall to prefer to withdraw blood products and hemodialysis over withdrawing mechanical ventilation and tube feedings.[1, 13] Nevertheless, here we have shown that among our subjects the *degree* of pref-

erence varies by specialty in a predictable and meaningful way.

While previous research has shown that many physician attributes are associated with decisions about whether to withdraw life support in general, only age has been shown in past research to be associated with decisions about which form of life support to withdraw.[13] The lack of significant variation in age among specialists in our sample makes it unlikely that confounding by age accounts for the patterns we have observed. Moreover, the mean age of the specialist physicians in this study was no different from the mean age of the matched comparison physicians.

Our study has several limitations. First, we studied physicians' expressed preferences in response to abstract questions and hypothetical scenarios rather than their revealed behaviors during actual clinical encounters. This limitation is difficult to avoid in research of this type. However, the physicians in our sample tended to be consistent with respect to their self-reported attitudes and behavior.[2] Second, we studied physicians affiliated with only one university. However, the physicians practiced in 24 different area community, government, and university hospitals. Third, given the response rate of less than 100%, the possibility of recruitment bias suggests caution in generalizing our results. However, there was no statistically significant difference between the respondents and the nonrespondents in several features we were able to measure (attending status, gender, and specialty).[2]

The results of this study suggest that just as some specialist physicians tend to reach for different technologies in treating patients, they may also tend to reach for those technologies when choosing which ones to withdraw. The symmetry revealed in these choices probably reflects specialists' familiarity with certain technologies compared with others. But in this case, it is as if familiarity breeds contempt. Specialists' preferences for different ways to withdraw life support not only may reflect a special understanding of the limits of certain technologies, but also may reveal how ingrained are physicians' patterns of practice.

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