Background: Important international differences exist in attitudes toward end-of-life issues in the intensive care unit.

Methods: A simple questionnaire survey was sent by e-mail to participants at an international meeting on intensive care medicine. Respondents were asked to choose 1 of 3 to 5 possible answers for each of 4 questions related to the treatment of a hypothetical patient in a vegetative state due to anoxic encephalopathy after cardiac arrest with no family and no advance directives.

Results: From 3494 valid addresses, 1961 complete questionnaires (56%) were received from 21 countries. Sixty-two percent of physicians from Northern and Central Europe said they involved nurses in end-of-life discussions compared with only 32% of physicians in Southern Europe, 38% in Brazil, 39% in Japan, and 29% in the United States (P<.001 for all comparisons). Written do-not-resuscitate orders were preferred in Northern and Central Europe, whereas oral orders took preference in Southern Europe, Turkey, and Brazil. One third of Japanese physicians said that they would not apply do-not-resuscitate orders. Most participants from Japan, Turkey, the United States, Southern Europe, and Brazil chose to treat the hypothetical patient with antibiotics if he/she developed septic shock, whereas in Northern Europe, Central Europe, Canada, and Australia, terminal withdrawal of mechanical ventilation and extubation were the more commonly chosen responses.

Conclusions: In countries where intensive care medicine is relatively well developed, considerable differences remain in physicians’ attitudes toward end-of-life care in the intensive care unit. Substantial work remains if an international consensus on these issues is to be reached.


Discussion: About end-of-life issues have become common, especially in the Western medical literature. Advances in medical technology and therapies enable more lives to be saved but sometimes may merely prolong the dying process. Recent studies have shown that the exact timing of death is often under the control of the physicians who care for the patient. This is particularly true in the intensive care unit (ICU), where death is commonly preceded by decisions not to start aggressive therapy (withholding) or to discontinue life-sustaining therapy (withdrawing). The question of who should be responsible for decision making is a difficult issue; the patient is often unable to participate in this decision, and the roles of the medical team, the relatives, and the legal system are highly variable in different parts of the world, adding to the variability of these end-of-life decisions and the difficulty in achieving an international consensus on these issues. Numerous reports exist on this topic, and several surveys have been conducted; however, these surveys were limited to national or geographic regions, and no large international survey has been performed. As previous studies have shown, substantial differences exist among European countries. Furthermore, the guidelines in the United States are also different from those within Europe. Although some would defend the need for the development of an international consensus or a global system of ethics, this may not be achievable or even desirable. In a recent survey of physicians involved in end-of-life care in 6 European countries and Australia, Miccinesi et al reported that country was the strongest determinant of physician attitude toward end-of-life decisions, although the in-
shown the strong influence of religion, culture, race, legal background, social factors, and tradition on attitudes toward end-of-life issues. In addition, these issues are influenced by and change with temporal trends, as illustrated by the Hippocratic Oath, which recognized the importance of the principles of beneficence, non-maleficence, and medical futility but did not discuss autonomy or distributive justice. During the last 4 decades, autonomy and distributive justice have become increasingly predominant.

To better understand the international differences in end-of-life decisions in the ICU, we conducted a simple international survey by e-mail. The aim of the study was to record current end-of-life attitudes of ICU physicians in those parts of the world where the practice of intensive care medicine is fairly well developed.

### METHODS

#### STUDY DESIGN

A list of e-mail addresses of individuals who had requested information regarding the International Symposium on Intensive Care and Emergency Medicine was provided by the meeting's secretariat. This symposium (www.intensive.org), held every year in Brussels, Belgium, is one of the largest international meetings in this field, with close to 5000 participants attending each year. We limited our list of addresses to physicians and to countries with more than 100 physicians in the database and, at the end of 2003, invited physicians on this list to reply to a simple questionnaire sent by e-mail. Two reminders were sent to those who did not reply to the first e-mail.

The questionnaire consisted of a case scenario and 4 questions with 3 to 5 optional answers (Table 1). The questionnaire was given in English, which is the official language of this international symposium. The participants were invited to answer by e-mail, and it was guaranteed that they would be anonymous in the data analysis. We excluded answers received from nonphysicians from the analysis. European countries were divided into 3 groups by geographic region: Northern Europe (Denmark, Finland, the Netherlands, Sweden, and the United Kingdom), Central Europe (Austria, Belgium, the Czech Republic, France, Germany, and Switzerland), and Southern Europe (Greece, Italy, Portugal, and Spain).

#### STATISTICAL ANALYSIS

Statistical analyses were performed using commercial software StatView 5.0 for Windows (SAS Institute Inc, Cary, NC). A χ² test was used to compare groups. Multivariate statistical analysis was also performed, using multiple correspondence analyses. Briefly, the method consists of the analysis of the 2-way contingency table in which the observed association between the rows (the region of origin of the respondent) and the columns (the responses to the different options) is summarized by the cell frequencies. The inference in correspondence analyses is whether certain levels of one characteristic (eg, region) are associated with some levels of another characteristic (eg, responses to the different options). Correspondence analysis is a geometric technique for displaying the rows and columns of this 2-way contingency table as vectors and points in low-dimensional space, such that the row vectors and column points are consistent with their associations in the table. The goal is to obtain a global view of the data that is useful for interpretation. The overall χ² of the contingency table reflects the degree of departure from a purely random distribution between the responses and the countries. If no relationship exists between the countries and the responses, the χ² will equal zero. The correspondence analysis will partition the χ² in dimensions that correspond to different angles of view of the data set. The first dimension is the best angle of view of the data, followed by the second dimension, and so on. Each dimension reflects a percentage of inertia, which corresponds to the proportion of the χ² statistic explored by this dimension (ie, the information contained in the data). The axis of the graph, labeled dimension, cannot be interpreted from a clinical standpoint. The advantage of the multivariate approach is to analyze the data globally and to take into account the correlation among the variables, thus reducing bias in the results. P<.05 was considered statistically significant.

### Table 1. The Questionnaire

<table>
<thead>
<tr>
<th>Case Scenario</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 55-year-old woman was resuscitated from cardiac pulmonary arrest due to cardiac ischemic disease and admitted to the intensive care unit (ICU) with severe postanoxic lesions.</td>
<td></td>
</tr>
<tr>
<td>Twenty-four hours later, she has decerebration movements and the evoked potentials are absent. The consensus (including the senior neurologist) is that her best possible outcome is a persistent vegetative state. She has no close relative or advance directive.</td>
<td></td>
</tr>
<tr>
<td>Question 1. Which process do you follow to decide on the treatment for this patient in the ICU?</td>
<td></td>
</tr>
<tr>
<td>1. Decide by yourself.</td>
<td></td>
</tr>
<tr>
<td>2. Decide after a consensus is reached with other physicians.</td>
<td></td>
</tr>
<tr>
<td>3. Decide after discussions involving other physicians and nurses.</td>
<td></td>
</tr>
<tr>
<td>4. Refer to the ethical committee in your hospital.</td>
<td></td>
</tr>
<tr>
<td>5. Refer to court.</td>
<td></td>
</tr>
<tr>
<td>Question 2. Is this process likely to result in do-not-resuscitate (DNR) orders being applied in the event of recurrent cardiac arrest?</td>
<td></td>
</tr>
<tr>
<td>1. Yes, written DNR orders.</td>
<td></td>
</tr>
<tr>
<td>2. Yes, verbal DNR orders.</td>
<td></td>
</tr>
<tr>
<td>3. No.</td>
<td></td>
</tr>
<tr>
<td>Question 3. The patient remains absolutely stable for 5 days and, although still receiving mechanical ventilation, can breathe spontaneously. What would be the usual strategy in your institution?</td>
<td></td>
</tr>
<tr>
<td>1. Keep the patient in the ICU (with or without tracheostomy) and start further interventions if a complication occurs.</td>
<td></td>
</tr>
<tr>
<td>2. Keep the patient in the ICU (with or without tracheostomy)—“wait and see”—but withhold therapy if a complication occurs.</td>
<td></td>
</tr>
<tr>
<td>3. Keep the patient in the ICU and start increasing doses of morphine or sedatives with the intent to decrease ventilatory conditions (“terminal weaning”).</td>
<td></td>
</tr>
<tr>
<td>4. Perform a tracheostomy and transfer the patient to the general ward for continued care.</td>
<td></td>
</tr>
<tr>
<td>5. Perform a tracheostomy and transfer the patient to the general ward, but with the intent to stop enteral feeding.</td>
<td></td>
</tr>
<tr>
<td>Question 4. While the possible options are being considered, let us imagine that the patient rapidly develops fever and septic shock, presumably due to lung infection. What would likely be done in your institution?</td>
<td></td>
</tr>
<tr>
<td>1. Maintain mechanical ventilation and start antibiotics and vasopressors.</td>
<td></td>
</tr>
<tr>
<td>2. Maintain mechanical ventilation and start antibiotics but no vasopressors.</td>
<td></td>
</tr>
<tr>
<td>3. Give morphine and reduce ventilatory conditions (“terminal weaning”).</td>
<td></td>
</tr>
<tr>
<td>4. Extubate and then give morphine (“terminal extubation”).</td>
<td></td>
</tr>
</tbody>
</table>

(Reprinted) Arch Intern Med/Vol 165, Sep 26, 2005 www.archinternmed.com

©2003 American Medical Association. All rights reserved.
The second question dealt with do-not-resuscitate (DNR) orders, for which a striking difference was noted among regions (P < .001; Figure 1). More than 80% of physicians in Northern and Central Europe, North America, and Australia said that they would be likely to apply written DNR orders in the hypothetical case presented. In contrast, in Southern Europe, Turkey, and Brazil, oral DNR orders were preferred. Japan was the country with the highest proportion (approximately one third of the respondents) who said that they would not apply DNR orders.

DO-NOT-RESUSCITATE ORDERS

Question 3 asked about the treatment of a patient in a vegetative state. Participants from Japan and Turkey were more likely to reply that they would continue full support than participants from the other countries (Figure 2). Australian and Canadian participants chose terminal withdrawal of mechanical ventilation as their response more commonly than participants from other countries. Northern Europe had a greater tendency to transfer patients to the general ward.

TREATMENT FOR A STABLE VEGETATIVE PATIENT

Question 4 raised the hypothesis that the vegetative patient developed septic shock (Figure 3). Choice of the full-support option ranged from 2% of respondents in Australia to 65% in Greece. The option to give antibiotics, with or without vasopressors (option 1 or 2), was selected by most physicians in Japan (96%), Turkey (81%), the United States (65%), Southern Europe (62%), and Brazil (39%) (P < .001 vs other regions), whereas in Northern Europe, Central Europe, Canada, and Australia, terminal withdrawal of mechanical ventilation and extubation were more commonly chosen.

COMMENT

This simple survey revealed striking international differences in the attitudes of ICU physicians toward end-of-life issues in adult patients. In our scenario-based questionnaire, we presented a patient with no family and no advance directives so that the responsibility for decision making would be on the physician or health care team rather than the family. Under these conditions, more physicians from the United States thought that it could be helpful to refer outside the ICU than other countries; it
is possible that the legal environment in the United States may have some influence on these decisions. In Europe, physicians seem to prefer to decide within the ICU team, rather than involving outside ethical or legal advisers. Participants in Northern and Central Europe replied that they were more likely to involve nurses in the decision making than were respondents from Southern European countries. Notably, participants from the United States were the least likely to report involving nurses.

The application of DNR orders varied with geographic region. Respondents from Australia, Canada, the United States, and Northern and Central Europe generally replied that they would apply written DNR orders. However, Turkey, Southern Europe, and Brazil preferred the oral DNR orders. A previous European study also showed that DNR orders were less commonly written in Southern than in Northern and Central Europe. In Japan, approximately one third of respondents would not apply DNR orders at all.

Participants from Turkey and Japan chose aggressive therapy with continued full support more often than participants from other countries. In Northern Europe, Central Europe, the United States, and Brazil, passive withdrawal of therapy, such as transfer to the general ward, was preferred over stopping feeding, extubating, or decreasing ventilator conditions. When a serious septic complication occurred in this hypothetical patient, respondents from Southern Europe, Turkey, Canada, the United States, Brazil, and Japan usually treated the complication with antibiotics, and Japanese physicians were also likely to give vasopressors. In contrast, in Northern and Central Europe, respondents were more likely to reply that they would actively withdraw therapy. In Australian respondents, the occurrence of sepsis did not alter the treatment plan. These data confirm prior studies of geographic dif-
ferences within Europe\textsuperscript{17,18} and studies of variability within the United States\textsuperscript{32} and Canada.\textsuperscript{15} In addition, our data show that these geographic differences continue to persist and that they extend around the world. Furthermore, the multiple correspondence analyses show that the countries do not all lie on 1 axis, suggesting variability in the responses within each country depending on individuals.

Our study has several limitations. First, the respondents were not a randomly selected sample of all critical care physicians because such a database does not exist. Rather, we used a list of potential participants at a major international critical care conference held annually in Europe. This may have resulted in a distance factor; respondents from Belgium and neighboring countries may be different from those coming from farther away. An alternative option would have been to use databases of regional scientific societies, but logistically this would have been much more difficult. Physicians attending such a conference may reflect a self-selected population with different attitudes from other critical care physicians. However, we would expect that the bias would be toward physicians with a more global perspective. This would suggest that true differences in different regions might actually be larger than found in this study. Second, to minimize the length of the survey and maximize the response rate, we have no information on the respondents’ backgrounds, age, sex, position in their hospital, or religion, and unidentified differences among countries in these subgroups may potentially have influenced the results. Third, the case scenario was by intent somewhat simplistic. Any

Figure 3. Responses to question 4 related to treatment for septic shock in a patient in a vegetative state. A, Physicians who would recommend terminal extubation; B, physicians who would recommend terminal withdrawal of mechanical ventilation; C, physicians who would recommend only antibiotics; and D, physicians who would do everything.
influence of relatives or the patients themselves on these decisions could not be taken into account. Moreover, as in all questionnaire studies, it is not always possible to provide an appropriate answer for all situations, and other options may have been preferred if they had been offered to the respondents. Fourth, the questionnaire was developed by the authors and did not undergo reliability or validity testing. Finally, although e-mail provides a rapid means of communication, answers are not really anonymous, which may have prevented some physicians from participating.

Nevertheless, this international survey presents an up-to-date indication of physicians’ attitudes toward end-of-life decision making in the ICU. Clearly, these attitudes differ not only in various regions of the globe but also within each country. Physicians’ attitudes surrounding end-of-life decision making in the ICU remain highly variable despite widespread discussion and publication of guidelines and recommendations.20–28 This is one area of intensive care medicine in which a global, uniform approach is difficult if not impossible to apply at this time. These issues are hard to measure objectively, and it is therefore difficult to determine best practice, unlike situations with clearer outcome measures such as the treatment of patients with acute myocardial infarction. Best practice in end-of-life care could perhaps be defined in terms of the society (expressed through local laws and social customs and beliefs), the profession (expressed through guidelines and consensus recommendations), or a more global view (where universal standards are identified and then applied to individual situations). However, although it is important to understand why differences exist, it may not be necessary or even appropriate to have an international consensus. Whether the international critical care community can, or should, work toward a global consensus on these issues regarding end-of-life care in the ICU remains unclear. Although we believe that there needs to be some global consensus on basic ethical principles, determining which aspects should be treated as globally definable and which must be left to individual countries, regions, or cultures requires further work. Continuing discussion among critical care physicians, based on results of surveys such as this, is needed to better understand the importance of international differences in end-of-life decision making in the ICU.

Accepted for Publication: May 17, 2005.
Correspondence: Jean-Louis Vincent, MD, PhD, Department of Intensive Care Medicine, Erasme Hospital, Free University of Brussels, Route de Lennik 808, B-1070 Brussels, Belgium (jlvincen@ulb.ac.be).
Financial Disclosure: None.

References