

End-of-Life Decision Making in the Intensive Care Unit

John M. Luce¹

¹University of California San Francisco, and San Francisco General Hospital, San Francisco, California

Increasingly in the United States and other countries, medical decisions, including those at the end of life, are made using a shared decision-making model. Under this model, physicians and other clinicians help patients clarify their values and reach consensus about treatment courses consistent with them. Because most critically ill patients are decisionally impaired, family members and other surrogates must make end-of-life decisions for them, ideally in accord with a substituted judgment standard. Physicians generally make decisions for patients who lack families or other surrogates and have no advance directives, based on a best interests standard and occasionally in consultation with other physicians or with review by a hospital ethics committee. End-of-life decisions for patients with surrogates usually are made at family conferences, the functioning of which can be improved by several methods that have been demonstrated to improve communications. Facilitative ethics consultations can be helpful in resolving conflicts when physicians and families disagree in end-of-life decisions. Ethics committees actually are allowed to make such decisions in one state when disagreements cannot be resolved otherwise.

Keywords: end-of-life care; palliative care; withdrawal of life support; surrogate decision-making

In 2004, a National Institutes of Health (NIH) State-of-the-Science Conference statement (1) defined end-of-life care as the care provided a person during the final stages of life. End-of-life care is also called palliative care, hospice care, and comfort care. According to the NIH Conference statement, there is no exact definition of life's final stages, nor can a person's time of death be accurately predicted. Nevertheless, the end of life most often is characterized by the presence of disease or disability that increases progressively and requires symptom management. Such management commonly supersedes or supplants potentially curative or restorative treatment designed to sustain life but not necessarily to comfort a person at the time of death.

End-of-life care was hardly a consideration when intensive care units (ICUs) were developed in the mid-20th century to provide invasive monitoring and medical interventions to the critically ill (2). Intensive care medicine was full of promise in those days, and ICU clinicians, especially physicians, seemed more interested in saving lives with new technologies than in comforting dying patients and their families. Nevertheless, as ICUs proliferated, the limitations of the therapies they provided were appreciated, along with the realization that some 20% of patients in countries like the United States die in ICUs or

shortly after discharge from them, usually after decisions to forego life-sustaining therapy have been made (3). As a result, end-of-life care in the ICU has become a clinical, educational, and research imperative (4).

Reflecting the strength of this imperative, end-of-life care in the ICU has been the subject of textbooks (5), journal supplements (6), and statements of the American Thoracic Society (7), the Society of Critical Care Medicine (8), and other professional organizations. Rather than repeat the substance of these publications, I focus in this review on what I consider the most significant issues in end-of-life care: (1) the importance and limitations of physician prognostication, (2) medical decision making for patients with families or other surrogates, (3) medical decision making for patients without families or other surrogates, (4) improving decision making for patients with families or other surrogates, and (5) resolving conflicts in decision making when physicians and surrogates disagree. I do not deal with the economic consequences of end-of-life care because this topic is so large and complex that it merits a separate review.

THE IMPORTANCE AND LIMITATIONS OF PHYSICIAN PROGNOSTICATION

However end-of-life decisions are made in the ICU, and regardless of who makes them, the decisions are profoundly influenced by physicians' predictions of patients' outcomes from critical illness. Such outcomes may include the likelihood that the patient will survive a critical illness and what the patient's length and quality of life probably will be if he or she leaves the ICU alive. Physicians may base prognoses on their own experience or on single- or multiinstitutional studies of specific diseases, such as acute lung injury (9). Other information has come from studies of certain age groups, such as the elderly (10), or of certain interventions, such as mechanical ventilation (11). Prognosis based on these studies is presumably more accurate than that of individual physicians. Yet the outcome of conditions such as acute lung injury changes over time and with the advent of new treatments (12), limiting the usefulness of research studies in predicting survival unless they are frequently updated.

Additional information has been obtained from the use of multitem prognostic scoring systems using physiological variables and other data. Perhaps the best known of these systems is the Acute Physiology and Chronic Health Evaluation (APACHE), which has gone through four iterations (13). Systems such as APACHE have been shown to be as accurate (or inaccurate) as clinical assessment by physicians and nurses (14). They also have demonstrated good calibration in that the overall hospital mortality predicted by the systems is comparable to that actually observed in research studies. Nevertheless, the systems have not discriminated well between individual survivors and nonsurvivors (15). As a result, the use of prognostic scoring systems remains adjunctive in that they provide

(Received in original form January 15, 2010; accepted in final form February 24, 2010)

Supported by the author's personal funds.

Correspondence and requests for reprints should be addressed to John M. Luce, M.D., Division of Pulmonary and Critical Care Medicine, San Francisco General Hospital, 1001 Potrero Avenue, Room 5K1, San Francisco, CA 94110. E-mail: jluce@medsfgh.ucsf.edu

Am J Respir Crit Care Med Vol 182, pp 6–11, 2010

Originally Published in Press as DOI: 10.1164/rccm.201001-0071CI on March 1, 2010

Internet address: www.atsjournals.org

information for medical decision making but cannot be used by themselves to decide who is destined to die while receiving intensive care (16).

Just as physician prognostication about individual patient survival is potentially problematic, so is physician assessment of how strongly patients esteem life, even if it is fraught with severe disabilities. Although some physicians might forego life-sustaining treatment for themselves if they were chronically ill, a substantial proportion of patients with chronic illness would consent to prolonged mechanical ventilation for merely a 1% chance of surviving ICU admission (17). Similarly, in a single-center study (18), 70% of patients who survived ICU admission, and the families of nonsurvivors, were willing to undergo ICU admission again to achieve even another month of survival. Such willingness may reflect not only individual choices but also religious, ethnic, and cultural values, as evidenced by a recent California HealthCare Foundation survey (19) in which 44% of adult African-Americans, 44% of Latinos, 28% of Asian-Americans, and 14% of non-Hispanic whites believed that “everything possible should be done in all circumstances to save a life.”

Studies such as this suggest that, because of their different values, patients, families, and physicians themselves may also differ in their concept of a “good death.” Physicians have long considered the prediction of disease and injury outcome as one of their most important duties; for much of medical history, they often could offer little more than such prediction to patients and families. But just as they rightfully regard prognostication as a professional responsibility, physicians should be aware of their limited ability to prognosticate accurately in many situations and of the limited persuasiveness of their prognostication on some patients and families. Physician prognostication is important to patients and families, even when they disagree with the prognoses offered them, as will be discussed. At the same time, patient and family values are as important as physician prognostication in decision making at the end of life.

MEDICAL DECISION MAKING FOR PATIENTS WITH FAMILIES OR OTHER SURROGATES

When ICUs were first developed, physicians assumed that patients and families would want to receive life-sustaining therapies, such as cardiopulmonary resuscitation (CPR) and mechanical ventilation, and often delivered these therapies without obtaining informed consent. Similarly, hospitals in the United States had universal resuscitation policies under which all patients received CPR regardless of their or their families’ wishes. As a result, physicians and nurses usually attempted to resuscitate all patients unless the clinicians performed “slow codes” to pretend compliance with hospital policies when they felt that CPR could not benefit patients. At the same time, patients receiving mechanical ventilation most often were ventilated until they died (2, 20).

Physicians in the early days of the ICU often operated under a paternalistic decision-making model that allowed them to judge which patients would benefit from medical interventions and apply them accordingly. This model was and is supported by the ethical principles of beneficence, doing good for patients, and nonmaleficence, avoiding harming them (21). Underlying the model is the assumption that physicians are better qualified than patients to make decisions by virtue of their superior knowledge and experience, and that they will protect patients’ interests because of their fiduciary obligations. The model is still used by some physicians and is particularly suited to emergency situations, in which consent is assumed.

Increasingly, the principle of respect for patient autonomy—the right of self-determination—has come to dominate medical decision making in the United States and other countries (21–23). Under this model, physicians are expected to discuss the nature and likely outcome of a given illness, explore the ramifications of forthcoming decisions, determine patient values, confirm that patients understand the information provided them, discuss preferred roles in decision making, and achieve consensus about treatment courses that are most consistent with patient values. Shared decision making differs from the informed choice model, under which physicians merely provide patients with treatment alternatives and other information with which patients can make decisions by themselves.

The ascent of respect for patient autonomy as a dominant ethical principle and the adoption of a shared decision-making model were facilitated in the United States by several factors. Among these factors were court decisions, such as *In re Quinlan* (24) and *Cruzan v Director, Missouri Department of Health* (25) that affirmed the right of patients who are capable of making decisions to refuse any and all therapies, including those that can sustain life. If the patients cannot make decisions, their families are allowed to do so for them, ideally under a substituted judgment standard. These and similar court decisions provide the only legal rationale for withholding and withdrawing life-sustaining therapies in the United States.

Another rationale, which may represent a reaction to the ascent of patient autonomy, is that physicians may not provide life-sustaining therapies to patients if doing so would be futile. This approach uses qualitative and quantitative definitions of futility (26) and was incorporated into what has been called “the futility movement” in the United States (27). The futility movement has been criticized on several grounds, the most compelling of which is that physicians, patients, and families may differ as to what constitutes futility because of their personal values (28). Furthermore, although clinicians are not obligated to perform medical interventions they consider unethical, and although studies (29) indicate that some physicians have withheld and withdrawn life support without the knowledge of patients and families or over their objections, American courts have never sanctioned this process. Unilateral end-of-life decision making by physicians also may invite claims of malpractice by families, although these are unlikely to be prosecuted successfully because of the difficulty of proving that physicians have violated the standard of care (30).

In its *Cruzan* decision, the United States Supreme Court observed that life-and-death decisions are deeply personal, that not all family members can or will provide substituted judgment, and that not all patients have families or other surrogates. It therefore allowed the states to require clear and convincing evidence of patients’ prior wishes—for example, through a written advance directive—before life support can be foregone for patients who are decisionally impaired. Although only Missouri and New York have imposed this requirement, the court’s concern about the adequacy and availability of family surrogates remains relevant in the ICU where, because of their diseases or the administration of psychoactive drugs, only a small minority of patients can make their own decisions (31).

Studies (32, 33) of substituted judgment among families of terminally ill patients in the United States have shown that surrogate decisions are reasonably concordant with what patients would decide, particularly if the surrogates and patients have discussed end-of-life issues beforehand. Yet discordance has been documented in the same studies, and many physicians have encountered surrogates who do not know what treatment patients would want at the end of life. Even so, most patients who have been interviewed by investigators in the United States

would prefer that family members, in consultation with clinicians, make medical decisions for them in the event of decisional impairment (34). Given these findings and the court decisions just discussed, it seems reasonable to replace “patients” with “surrogates” in the shared decision-making model and let family members make end-of-life decisions for decisionally impaired patients in the ICU.

In addition to being reasonable, using families or other surrogates to make decisions for decisionally impaired patients also is practical. The status of the critically ill can change quickly, making the legal system, which relies on judges or court-appointed guardians to make decisions for patients who cannot do so, too slow to be useful in many circumstances. Furthermore, in my experience, judges and guardians generally have limited medical knowledge and usually defer to physicians regarding prognosis and other issues unless family members object. As a result, judicial review is superfluous unless conflict between clinicians and surrogates exists. In the absence of conflict, most officers of the court rightfully allow medical decisions for impaired patients to be made by physicians and families or other surrogates.

Hospital ethics committees historically have played an advisory and facilitative rather than a proscriptive role (35). Such committees also may lack clinicians with the expertise necessary to improve the decision-making process in some situations. At the same time, the committees most often are made up of institutional representatives and may contain few members from the community (36). Because of this, they may not represent patient and family interests adequately and may not be the appropriate mechanism for making end-of-life decisions unless physicians and families are conflicted and institutional policies or state regulations allow the committees to fulfill a judicial function, as will be discussed.

MEDICAL DECISION MAKING FOR PATIENTS WITHOUT FAMILIES OR OTHER SURROGATES

According to a recent multicenter study (37), approximately 5% of ICU deaths occurred in decisionally impaired patients, many of them homeless, who lacked surrogates and advance directives. For such patients, physicians generally made decisions to limit life support, often with review by other physicians, occasionally with review by hospital ethics committees, and rarely with court review. In the absence of advance directives, which might have allowed for a semblance of substituted judgment, physicians who made such decisions generally cited poor prognosis for hospital survival, predicted poor quality of life, and belief that treatment was not in the patients’ best interests. Their practice was not always in keeping with widely varying hospital policies, professional society guidelines, and state laws regarding who should make end-of-life decisions for this large patient population.

The preferences of the patients themselves were not known in the aforementioned study. However, another study (38) involving interviews of nonhospitalized homeless persons without families revealed that half would want physicians to make end-of-life decisions for them if they were decisionally impaired and that 80% would prefer physicians to court-appointed guardians. Yet the homeless were more likely to want CPR and mechanical ventilation if they were comatose than physicians surveyed in this study were inclined to provide. The possibility that physicians might not treat patients without families as the patients may wish is supported by another study (39) revealing that decisions to limit life support are more strongly related to the identity of critical care physicians than to comorbid conditions, acute diagnostic category, and the source of ICU admission.

Despite the potential disadvantages of decision making by physicians for patients without families or other surrogates, whether a better mechanism exists is unclear. All the limitations of the legal system in dealing with patients who have surrogates apply to those who lack them. The same is true of ethics committees. Nevertheless, ethics committee review of physician decisions would have the advantages of requiring that the rationale for the decisions, particularly physician perceptions of the patients’ best interests, be articulated, and that the decisions are consonant with institutional policies and state laws. At the same time, review by ethics committees might help engender public trust, especially if the committees contain community representatives, because physicians could no longer make end-of-life decisions in isolation for patients without families (37).

IMPROVING DECISION MAKING FOR PATIENTS WITH FAMILIES OR OTHER SURROGATES

End-of-life decisions in the ICU usually are made at family conferences, the dynamics of which have been explored in recent years. One study (22) of these dynamics has demonstrated that although shared decision making about end-of-life treatment choices is commonplace at family conferences, it often is incomplete, especially at conferences including less-educated families. To increase shared decision making, investigators (40) involved in the aforementioned study have recommended that family conferences be held soon after patients are admitted to the ICU and periodically thereafter. When possible, the conferences should be held in a private place, organized and led by senior physicians, and attended by the clinicians—nurses as well as physicians—with whom the families regularly interact. Consultants such as social workers, spiritual advisers, and interpreters are an essential part of the ICU team and should be invited to participate in family conferences, especially at family request. According to the investigators, interdisciplinary communication is associated with higher patient satisfaction and is recognized by patients and families as a major component of good end-of-life care.

The importance of interdisciplinary communication was highlighted in a before-and-after study (41) of an intensive communication intervention at an academic hospital. This intervention was extended to all patients with a predicted ICU length of stay longer than 5 days and a predicted ICU mortality of greater than 25% estimated by the attending physician. Under the intervention, interdisciplinary meetings led by attending physicians were held within 72 hours of ICU admission, and a treatment plan based on the patients’ and families’ goals and expectations was developed. Clinical “milestones” indicative of recovery or worsening were identified with time frames for their occurrence. Follow-up meetings were held to discuss palliative care as the need for it increased. When compared with the period before it was introduced, the intensive communication intervention was associated with a decrease in ICU length of stay for patients who died, with no increase in overall ICU mortality. Although this study has not been duplicated, and although which components of the intensive communication intervention had the greatest impact on ICU length of stay could not be determined from the study, improved communication seems generally advisable.

In my experience, communication often can be improved if a representative can be identified to speak for the entire family at meetings, especially if family members disagree among themselves. In some instances, that representative will carry a durable power of attorney for health care and will have legal authority. If a durable power of attorney has not been assigned,

investigators (40) recommend that the family be told that it is the major source of information about the patient's values. Because patient and family values may differ, the family should be schooled in the concept of substituted judgment and advised that it will be asked to help make decisions based on its knowledge of what the patient would want in a given situation. If a written advance directive is available, it can be referred to, even though advance directives have not been shown to strongly influence treatment decisions made either by physicians or families (42).

Some families may prefer to make most medical decisions in the ICU, including those at the end of life; others let physicians assume complete responsibility (43). **Whatever role a family prefers, it probably should be determined early in the decision-making process (40).** Furthermore, the role may change with the patient's condition. A family that is assertive when the patient is first admitted and the outlook is good may grant more decision-making responsibility to physicians if the patient's status declines. This observation underscores the importance of physician prognostication in the decision-making process and the necessity of updating prognosis regularly at family conferences.

Unfortunately, physicians sometimes do not speak in absolutes when discussing prognosis with families and do not explicitly discuss the patient's chance for short-term survival (44). Yet recent studies (44) have shown that, regardless of their decision-making role, most families want physicians to make specific recommendations on whether or not to continue treatment based on a patient's prognosis. Furthermore, most families want physicians to discuss the patient's prognosis even when they doubt the physicians' ability to prognosticate accurately. Families generally do not view withholding prognostic information as a way to maintain hope (45). Whether they agree with the prognosis or not, discussions about it help families prepare for the possibility that the patient will die (46).

Although they want specific recommendations and prognostic estimations from physicians, families are more satisfied if they are listened to, rather than talked at, during family conferences (47). A communication strategy featuring longer conferences and more time for families to talk, along with distribution of a brochure, lessened the effects of bereavement on families in one recent study from France (48). Families also appreciate assurances that pain will be treated and suffering ameliorated throughout the ICU stay, that the patient will not be abandoned, and that the family's decisions will be respected (49, 50). Family satisfaction is enhanced by clinicians' empathetic statements that acknowledge the difficulty of having a family member in the ICU, making decisions for a family member, and seeing a family member die (51).

The pace of hospital practice is fast; physicians and nurses may feel obligated to move critically ill patients through the health care system, and families frequently report being pressured by clinicians to withhold or withdraw life-sustaining therapy (52). Physicians and nurses should be aware of this pressure when it exists and should understand what prompts them to exert it (53). They also should appreciate that many families need time to adjust to a patient's decline and imminent death, and that a "stuttering withdrawal," in which some therapies are continued while others are removed, may be preferred by some families, probably because it gives them more time to come to terms with the patient's death. This explanation was put forward by the investigators of a recent study (54) who, despite their belief that the goals of care are less clear during a stuttering withdrawal, found that a longer duration of withdrawal was associated with increased family satisfaction.

RESOLVING CONFLICTS IN DECISION MAKING WHEN PHYSICIANS AND SURROGATES DISAGREE

Most families and physicians eventually reach agreement about whether and when life-sustaining therapies should be foregone (55). Nevertheless, some families may disagree that life support be withheld or withdrawn despite recommendations to the contrary. Infrequent and inadequate interaction between families and clinicians probably accounts for this disagreement in most instances, but it can occur even when communication is excellent, extra time is allowed for discussion, and prognostic information is updated regularly. Differences in personal values often seem to underlie conflicts between physicians and families, along with family refusals to accept the prognoses provided to them (52).

Because many families correctly regard prognostication as being imperfect, such refusal should not be surprising (56). Furthermore, families may be satisfied if their members survive the ICU with disabilities that physicians would not want for themselves, such as being in a persistent vegetative state, as discussed earlier. Yet even when these reservations are accounted for, some families may request therapies that clinicians consider futile under the strictest definition of that term—for example, prolonged mechanical ventilation for an anencephalic infant or for a patient with multiple-organ failure after bone marrow transplantation (57). In these and similar circumstances, and especially in the absence of advance directives, physicians may rightly ask whether families truly are exercising substituted judgment or serving patients' interests.

When families and physicians disagree over continuing treatment, physicians sometimes choose to withdraw life support unilaterally, although they run the risk of being sued for malpractice and accruing defense costs whether or not the suit is successful (29). When physicians in Massachusetts wrote a do-not-resuscitate order and withdrew support over a family member's objections in the *Gilgunn* case (58), neither they nor their hospital were penalized by the court. However, when clinicians and health care facilities have asked courts to sanction such withdrawal before it is performed, the courts have traditionally sided with families, as in the *Baby K* case (59) in Virginia and the *Wanglie* case in Minnesota (60), without facing the issue of futile or inappropriate care directly. The verdicts in these last two cases in the United States differ from those in recent cases in Canada (61) and Australia (62), wherein the courts allowed physicians to make end-of-life decisions over family objections, presumably because of the physicians' superior medical knowledge.

Given the lack of legal clarity on end-of-life decision making in the United States, clinicians probably should seek conflict resolution outside the judicial system. One potentially useful mechanism is consultation with palliative care teams or ethics committees. In this regard, a recent multicenter study (63) demonstrated that ethics consultations were associated with reductions in hospital and ICU lengths of stay and life-sustaining treatments in patients who ultimately did not survive to discharge. The majority of physicians, nurses, and families interviewed in this study agreed that ethics committee consultations, which were advisory and facilitative but not proscriptive, were helpful in addressing treatment conflicts.

An alternative approach, recommended by the American Medical Association (64), is to have ethics committees actually make decisions at the end of life when families and physicians cannot do so. This so-called due process approach was incorporated in 1999 into an amendment to the Texas Advance Directives Act (65). It allows a physician to ask a hospital ethics

committee to review a patient or family request for treatment the physicians consider futile or inappropriate. If the committee agrees that the request is inappropriate and no other physician or hospital will accept the patient in transfer within a 10-day time period, the treatment may be withheld or withdrawn (65). So far, most ethics committee decisions have favored physicians over patients and families under the Advance Directives Act (66, 67).

The Texas Advance Directives Act has been supported by one of its developers (68) as an effective and ethical method to resolve disputes about medical futility. On the other hand, it has been criticized for empowering ethics committees, with their probable institutional bias, to serve as judges and juries, especially for patients who are economically deprived (69). Investigators (70) who have written extensively about both futility and family conferences have argued that almost all cases in which physicians and families disagree about end-of-life care can be resolved with early and intensive communication and a "principled negotiation" approach at the bedside. In the small number of cases in which even the best efforts at communication and negotiation fail, they recommend that clinicians find ways to better support each other in providing care, rather than overriding the requests of patients and their families.

CONCLUSION

The constitutionality of the Texas Advance Directives Act has not been determined, and how widely its due process approach is being and will be used in other states is unclear. Nevertheless, for all of the debate over the Act, most end-of-life decisions are reached easily by physicians and families, so that conflict resolution rarely is required. Physician prognostication and patient and family values are the most important components of end-of-life decision making, which increasingly is based on a shared model that, for all its prevalence, still can be improved on.

Conflict of Interest Statement: J.L. received more than \$100,001 per year for serving as a consultant and expert witness for various law firms.

Acknowledgment: The author thanks Judith A. Luce, MD, and two anonymous reviewers for providing valuable editorial assistance.

References

- National Institutes of Health State-of-the Science Conference Statement on Improving End-of-Life Care, December 6–8, 2004 [accessed February 15, 2010]. Available from <http://consensus.nih.gov/2004/2004EndOfLifeCareSOSQ24html.htm>
- Luce JM, White DB. A history of ethics and law in the intensive care unit. *Crit Care Clin* 2009;25:221–237.
- Angus DC, Barnato AE, Linde-Zwirble WT, Weissfeld LA, Watson RS, Rickert T, Rubenfeld GD, on behalf of the Robert Wood Johnson Foundation ICU End-of-Life Peer Group. Use of intensive care at the end of life: an epidemiological study. *Crit Care Med* 2004;32:638–643.
- White DB, Luce JM. Palliative care in the intensive care unit: barriers, advances, and unmet needs. *Crit Care Clin* 2004;20:329–343.
- Curtis JR, Rubenfeld GD, editors. Managing death in the ICU: the transition from cure to comfort. New York, NY: Oxford University Press; 2002.
- Levy MM, Curtis JR, editors. Improving the quality of end-of-life care in the ICU. *Crit Care Med* 2006;34:S301–S420.
- Lanken PN, Terry PB, DeLisser HM, Fahy BF, Hansen-Flaschen J, Heffner JE, Levy M, Mularski RA, Osborne ML, Prendergast TJ, et al., on behalf of the ATS End-of-Life Care Task Force. An official American Thoracic Society clinical policy statement: palliative care for patients with respiratory diseases and critical illnesses. *Am J Respir Crit Care Med* 2008;177:912–927.
- Truog RD, Campbell ML, Curtis JR, Haas CE, Luce JM, Rubenfeld GD, Rushton CH, Kaufman DC. Recommendations for end-of-life care in the intensive care unit: a consensus statement by the American Academy of Critical Care Medicine. *Crit Care Med* 2008;36:953–963.
- Fowler AA, Hamman RF, Zerbe GO, Benton KN, Hyers TM. Adult respiratory distress syndrome: prognosis after onset. *Am Rev Respir Dis* 1985;132:472–478.
- Chelluri L, Pinsky MR, Donahoe MP, Grenvik A. Long-term outcome of critically ill elderly patients requiring intensive care. *JAMA* 1993;269:3119–3123.
- Gillespie DJ, Marsh HMM, Divertie MB, Meadows JA. Clinical outcome of respiratory failure in patients requiring prolonged (>24 hours) mechanical ventilation. *Chest* 1986;90:364–369.
- Rubinfeld GD, Caldwell E, Peabody E, Weaver J, Martin DP, Neff M, Stern EJ, Hudson LD. Incidence and outcome of acute lung injury. *N Engl J Med* 2005;353:1685–1693.
- Zimmerman JE, Kramer AA, McNair DS, Malila FM. Acute Physiology and Chronic Health Evaluation (APACHE) IV: hospital mortality assessment for today's critically ill patients. *Crit Care Med* 2006;34:1297–1310.
- Kruse JA, Thill-Baharozian NC, Carlson RW. Comparison of clinical assessment with APACHE II for predicting mortality risk in patients admitted to a medical intensive care unit. *JAMA* 1988;260:1739–1742.
- Zimmerman JE, Wagner DP, Draper EA, Wright L, Alzola C, Knaus WA. Evaluation of Acute Physiology and Chronic Health Evaluation III predictions of hospital mortality in an independent database. *Crit Care Med* 1998;26:1317–1326.
- Luce JM, Wachter RM. The ethical appropriateness of using prognostic scoring systems in clinical management. *Crit Care Clin* 1994;10:229–241.
- Lloyd CB, Nietert PJ, Silvestri GA. Intensive care decision making in the seriously ill and elderly. *Crit Care Med* 2004;32:649–654.
- Danis M, Patrick DL, Southerland LL, Green ML. Patients' and families' preferences for medical intensive care. *JAMA* 1988;260:797–802.
- California HealthCare Foundation. Attitudes towards end-of-life care in California [accessed May 6, 2010]. Available from <http://www.chcf.org/publications/2007/03/racial-cultural-and-ethnic-factors-affecting-the-quality-of-end-of-life-care-in-california>
- Gazelle G. The slow code – should anyone rush to its defense? *N Engl J Med* 1998;338:467–469.
- Beauchamp TL, Childress JF. Principles of biomedical ethics, 5th Ed. New York, NY: Oxford University Press; 2001.
- White DB, Braddock CH III, Berekniiyeu S, Curtis JR. Toward shared decision making at the end of life in intensive care units: opportunities for improvement. *Arch Intern Med* 2007;167:461–467.
- Thompson BT, Cox PN, Antonelli M, Carlet JM, Cassell J, Hill NS, Hinds CJ, Pimentel JM, Reinhart K, Thijs LG. Challenges in end-of-life care in the ICU: statement of the 5th International Consensus Conference in Critical Care: Brussels, Belgium, April 2003: executive summary. *Crit Care Med* 2004;32:1781–1784.
- In re Quinlan*, 755 A2A 647 (NJ), cert denied, 429 70 NJ 10, 355 A2d 647 (1976).
- Cruzan v. Director, Missouri Dept. of Health*. 110 S Ct 2841 (1990).
- Schneiderman LJ, Jecker NS, Jonsen AR. Medical futility: its meaning and ethical implications. *Ann Intern Med* 1990;112:949–954.
- Helft SM, Lantos J. The rise and fall of the futility movement. *N Engl J Med* 2000;343:293–296.
- Truog RD, Brett AS, Frader J. The problem with futility. *N Engl J Med* 1992;326:1560–1564.
- Asch DA, Hansen-Flaschen J, Lanken P. Decisions to limit or continue life-sustaining treatment by critical care physicians in the United States: conflicts between physicians' practices and patients' wishes. *Am J Respir Crit Care Med* 1995;151:288–292.
- Luce JM, Alpers A. Legal aspects of the withholding and withdrawal life support from critically ill patients in the United States and administering palliative care to them. *Am J Respir Crit Care Med* 2000;162:2029–2032.
- Luce JM. Is the concept of informed consent applicable to clinical research involving critically ill patients? *Crit Care Med* 2003;31:S153–S160.
- Seckler AB, Meier DE, Mulvihill M, Paris BE. Substituted judgment: how accurate are proxy predictions? *Ann Intern Med* 1991;111:92–98.
- Sulmasy DP, Terry PB, Weisman CS, Miller DJ, Stallings RY, Vettese MA, Haller KB. The accuracy of substituted judgments in patients with terminal diagnoses. *Ann Intern Med* 1998;128:621–629.
- Puchalski CM, Zhong Z, Jacobs MM, Fox E, Lynn J, Harrold J, Galanos A, Phillips RS, Califf R, Teno JM. Patients who want their families and physicians to make resuscitation decisions for them: observations from SUPPORT and HELP. *J Am Geriatr Soc* 2000;48:S84–S90.

35. Fletcher JC, Siegler M. What are the goals of ethics consultations? A consensus statement. *J Clin Ethics* 1996;7:122–126.
36. Truog RD. Tackling medical futility in Texas. *N Engl J Med* 2007;357:1–3.
37. White DB, Curtis JR, Wolf LE, Prendergast TJ, Taichman DB, Kuniyoshi G, Acerra F, Lo B, Luce JM. Life support for patients without a surrogate decision maker: who decides? *Ann Intern Med* 2007;147:34–40.
38. Norris WM, Nielsen EL, Engelberg RA, Curtis JR. Treatment preferences for resuscitation and critical care among homeless persons. *Chest* 2005;127:2180–2187.
39. Garland A, Connors AF. Physicians' influence over decisions to forego life support. *J Palliat Med* 2007;10:1298–1305.
40. Curtis JR, White DB. Practical guidance for evidence-based ICU family conferences. *Chest* 2008;134:835–843.
41. Lilly CM, DeMeo DL, Sonna LA, Haley KJ, Massaro AF, Wallace RF, Cody S. An intensive communication intervention for the critically ill. *Am J Med* 2000;109:469–475.
42. Danis M, Multran E, Garrett JM. A prospective study of the impact of patient preferences on life-sustaining treatment and hospital cost. *Crit Care Med* 1996;24:1811–1818.
43. White DB, Engelberg R, Wenrich M, Lo B, Curtis JR. Prognostication during patient-family discussions about limiting life support in intensive care units. *Crit Care Med* 2007;35:442–448.
44. Evans LR, Boyd EA, Malvar G, Apatira L, Luce JM, Lo B, White DB. Surrogate decision-makers' perspectives on discussing prognosis in the face of uncertainty. *Am J Respir Crit Care Med* 2009;179:48–53.
45. Apatira L, Boyd EA, Malvar G, Evans LR, Luce JM, Lo B, White DB. Hope, truth, and preparing for death: perspectives of surrogate decision makers. *Ann Intern Med* 2008;149:861–868.
46. White DB, Evans LR, Bautista CA, Luce JM. Are physicians' recommendations to limit life support beneficial or burdensome? Bringing empirical data to the debate. *Am J Respir Crit Care Med* 2009;180:320–325.
47. McDonagh JR, Elliott TB, Engelberg RA. Family satisfaction with family conferences about end-of-life care in the ICU: increased proportion of family speech is associated with increased satisfaction. *Crit Care Med* 2004;32:1484–1488.
48. Lautrette A, Darmon M, Megarbane B, Joly LM, Chevret S, Adrie C, Barnoud D, Bleichner G, Bruel C, Choukroun G, et al. A communication strategy and brochure for relatives of patients dying in the ICU. *N Engl J Med* 2007;356:469–478.
49. Gries CJ, Curtis JR, Wall RJ, Engelberg R. Family member satisfaction with end-of-life decision making in the ICU. *Chest* 2008;133:704–712.
50. West HF, Engelberg RA, Wenrich MD, Curtis JR. Expressions of nonabandonment during the intensive care unit family conference. *J Palliat Med* 2005;8:797–807.
51. Selph RB, Shiang J, Engelberg RA, Curtis JR, White DB. Empathy and life support decisions in intensive care units. *J Gen Intern Med* 2008;23:1311–1317.
52. Kaufman SR. . . . And a time to die: how american hospitals shape the end of life. New York, NY: Scribner; 2005.
53. Luce JM, White DB. The pressure to withhold or withdraw life-sustaining therapy from critically ill patients in the United States. *Am J Respir Crit Care Med* 2007;175:1104–1108.
54. Gerstel E, Engelberg RA, Koepsell T, Curtis JR. Duration of withdrawal of life support in the intensive care unit and association with family satisfaction. *Am J Respir Crit Care Med* 2008;178:798–804.
55. Smedira NG, Evans BH, Grais LS, Cohen NH, Lo B, Cooke M, Schechter WP, Fink C, Epstein-Jaffe E, May C, et al. Withholding and withdrawal of life support from the critically ill. *N Engl J Med* 1990;322:309–315.
56. Zier LS, Burack JH, Micco G, Chipman AK, Frank JA, Luce JM, White DB. Doubt and belief in physicians' ability to prognosticate during critical illness: the perspective of surrogate decision makers. *Crit Care Med* 2008;36:2341–2347.
57. Rubenfeld GD, Crawford SW. Withdrawing life support from mechanically ventilated recipients of bone marrow transplants: a case for evidence-based guidelines. *Ann Intern Med* 1996;125:625–633.
58. *Gilgunn v Massachusetts General Hospital*. Na:92–4820 (Mass Super Ct Civ Action Suffolk S, April 2, 1995).
59. *In re Baby K*. 832 Supp 1022 (ED Va 1993).
60. *In re Helen Wanglie*, Fourth Judicial District b(Dist St. Probate Ct Div) PX-91–283. Minnesota, Hennipin County.
61. *Rotaru v. Vancouver General Hospital intensive care unit*. 2008, BC SC 318.
62. *In re I.H.V.*, 2008, ABQB 250.
63. Schneiderman LJ, Gilmer T, Teetzel HD, Dugan DO, Blustein J, Crandall R, Briggs KB, Komatsu GI, Goodman-Crews P, Cohn F, et al. Effect of ethics consultations on nonbeneficial life-sustaining treatments in the intensive care setting: a randomized controlled trial. *JAMA* 2003;290:1166–1172.
64. Council on Ethical and Judicial Affairs, American Medical Association. Medical futility in end-of-life care: report of the Council on Ethical and Judicial Affairs. *JAMA* 1999;281:937–941.
65. Texas Health and Safety Code 166.046.
66. Fine RL, Mayo TW. Resolution of futility by due process: early experience with the Texas Advance Directives Act. *Ann Intern Med* 2003;138:743–746.
67. Smith ML, Gremillion G, Slomka J, Warneke CL. Texas hospitals' experience with the Texas Advance Directives Act. *Crit Care Med* 2007;35:1271–1276.
68. Fine RL. Point: the Texas Advance Directives Act effectively and ethically resolves disputes about medical futility. *Chest* 2009;136:963–967.
69. Truog RD. Counterpoint: the Texas Advance Directives Act is ethically flawed. *Chest* 2009;136:968–971.
70. Burns JF, Truog RD. Futility: a concept in evolution. *Chest* 2007;132:1987–1993.