

The Effect of Do-Not-Resuscitate Orders on Physician Decision-Making

Mary Catherine Beach, MD, MPH* and R. Sean Morrison, MD†

The effect of do-not-resuscitate (DNR) orders on physicians' decisions to provide life-prolonging treatments other than cardiopulmonary resuscitation (CPR) for patients near the end of life was explored using a cross-sectional mailed survey. Each survey presented three patient scenarios followed by 10 treatment decisions. Participants were residents and attending physicians who were randomly assigned surveys in which all patient scenarios included or did not include a DNR order.

Response to three case scenarios when a DNR order was present or absent were measured. Response from 241 of 463 physicians (52%) was received. Physicians agreed or strongly agreed to initiate fewer interventions when a DNR order was present versus absent (4.2 vs 5.0 ($P = .008$) in the first scenario; 6.5 vs 7.1 ($P = .004$) in the second scenario; and 5.7 vs 6.2 ($P = .037$) in the third scenario). In all three scenarios, patients with DNR orders were significantly less likely to be transferred to an intensive care unit, to be intubated, or to receive CPR. In some scenarios, the presence of a DNR order was associated with a decreased willingness to draw blood cultures (91% vs 98%, $P = .038$), central line placement (68% vs 80%, $P = .030$), or blood transfusion (75% vs 87%, $P = .015$). The presence of a DNR order may affect physicians' willingness to order a variety of treatments not related to CPR. Patients with DNR orders may choose to forgo other life-prolonging treatments, but physicians should elicit additional information about patients' treatment goals to inform these decisions. *J Am Geriatr Soc* 50:2057-2061, 2002.

Key words: Resuscitation orders; ethics; medical; decision making; palliative care

Do-not-resuscitate (DNR) orders are intended to allow patients to forgo cardiopulmonary resuscitation (CPR) in the event of cardiopulmonary arrest. Although patients who choose this option may also choose to forgo other life-sustaining interventions, a DNR order is not intended to apply to any treatment other than CPR. Early published guidelines urge, "nothing in the entire procedure should indicate to the patient and family any intention to diminish the appropriate medical and nursing attention to be received by the patient."¹

In 1983, the Presidents Commission on Deciding to Forgo Life-Sustaining Treatment affirmed this view by stating, "Any DNR policy should ensure that the order not to resuscitate has no implications for any other treatment decisions. Patients with DNR orders on their charts may still be appropriate candidates for all other vigorous care, including Intensive Care Units."² Later, the American Medical Association's Council on Ethical and Judicial Affairs published guidelines indicating that "DNR orders only preclude resuscitative efforts and should not influence other therapeutic interventions that may be appropriate."³

Despite these warnings, there remains a well-recognized potential for DNR orders to be broadly applied to a variety of other therapies.⁴ Several studies conducted more than a decade ago documented this phenomenon.⁵⁻⁸ One study surveyed primary and cross-covering residents of patients with DNR orders and found that residents intended to withhold a variety of other therapeutic interventions, that in half of these instances there was no chart documentation to that effect, and that there was little agreement between primary and cross-covering residents regarding which therapies to withhold.⁵ Several retrospective chart reviews have found that patients in hospitals and long-term care facilities with DNR orders receive fewer life-prolonging treatments, even after controlling for age, functional status, and severity of illness.^{7,8}

Based on our clinical experience as a medical resident (MCB) and a practicing palliative care physician and geriatrician (RSM), we believed that physicians continue to use DNR orders as surrogate markers for patients' goals of care rather than as specific treatment preference. We

From the *Division of General Internal Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland; and †Department of Geriatrics, Hertzberg Palliative Care Institute, Mount Sinai School of Medicine, New York, New York.

Dr. Beach is a Greenwall Fellow in Bioethics and Health Policy. Dr. Morrison is a Paul Beeson Faculty Scholar in Aging Research, an Open Society Institute Project on Death in America Faculty Scholar, and the recipient of Mentored Clinical Scientist Development Award K08AG00833-01 from the National Institute on Aging.

Address correspondence to Mary Catherine Beach, MD, MPH, Division of General Internal Medicine, Johns Hopkins University School of Medicine, 1830 East Monument Street, Room 8016, Baltimore, MD 21205. E-mail: mcbeach@jhmi.edu

hypothesized that physicians who were presented identical patients would withhold treatments other than CPR in the presence of a DNR order. A cross-sectional survey of physicians was conducted to determine the isolated effect of a DNR order on physicians' likelihood of initiating specific therapeutic interventions for three hypothetical patients.

METHODS

Survey Development

A survey instrument was designed that presented three clinical vignettes involving patients with serious and life-threatening illness (copies of the vignettes are available from the authors). The first vignette (a 72-year-old man with advanced multiple myeloma and dementia who develops a change in mental status) was developed by modifying a case description that had been used in another survey (Clemente and Habert, unpublished data). Two other vignettes (a 48-year-old woman with apparent metastatic breast cancer who develops postobstructive pneumonia and a 34-year-old man with advanced acquired immunodeficiency syndrome who develops presumed pneumocystic pneumonia) were developed based on actual patient scenarios. Two versions of the survey were simultaneously created: one version in which all three patients had a DNR order and one version in which none of the patients had a DNR order.

A series of 10 sequential treatment decisions followed each vignette. Three of the first eight treatment decisions were common to all the scenarios (blood cultures, central line placement, and intensive care unit (ICU) transfer), and the other five treatment decisions were organized so that each scenario contained one of each of the following categories: simple noninvasive therapies (blood transfusion, antibiotics, supplemental oxygen), noninvasive radiographic tests (computerized tomography (CT) of the head, bone scan, CT of the abdomen), invasive diagnostic procedures (lumbar puncture, thoracentesis, bone marrow biopsy), complex invasive diagnostic procedures (esophagogastroduodenoscopy (EGD), colonoscopy, bronchoscopy), and complex invasive therapies (hemodialysis, inferior vena cava filter, abdominal surgery). The final two treatment decisions in each scenario involved emergent intubation and CPR. Using a 4-point Likert scale (strongly agree to strongly disagree), respondents were asked to indicate whether they would initiate these interventions. Respondents were then asked to indicate on a 4-point Likert (strongly agree to strongly disagree) scale whether they believed the patient would survive a cardiopulmonary arrest to leave the hospital.

The surveys were pilot tested with a group of colleagues and then further modified the vignettes based on their feedback. There were two final versions of the survey that presented the three scenarios in the same order (Mr. M, Mrs. T, and then Mr. H) and collected basic demographic data and information about comfort and experience with dying patients.

Survey Administration

Physicians were randomly assigned to receive one of two survey versions in which all three patients did or did not have a DNR order. The surveys were mailed in the winter

of 1997 to all house staff and attending physicians within the Department of Medicine of a large urban academic medical center. A self-addressed stamped envelope with a unique identification number to track respondents was included. There was no identification information on the survey itself, and the return envelopes were destroyed after the response was noted. Respondents were informed that a study about physician decision-making at the end of life was being conducted. A second copy of the survey was mailed to nonrespondents after 3 weeks. Finally, those who did not respond to our second mailing were telephoned to ask for their participation. These surveys and protocol received approval from the Institutional Review Board at the Mount Sinai School of Medicine.

Analysis

The primary aim of this analysis was to compare the decision-making of physicians who responded to scenarios in which the patient had or did not have a DNR order. For this purpose, the primary outcome variable was created as the sum of the number of interventions that the respondent agreed/strongly agreed to initiate. The final two decisions to initiate CPR or intubate in this variable were not included, because, in the state in which this study was performed, a DNR order applies to either a cardiopulmonary or pulmonary arrest, so both CPR and intubation should legally have been withheld from our hypothetical patients with DNR orders. Inclusion of these interventions would have biased the study in favor of our hypothesis. Therefore, the number of interventions that the respondent agreed/strongly agreed to initiate could range from 0 to 8, and a decrease of 1.0 on this scale represents a 12.5% decrease in the number of interventions that the physicians would initiate. Because this variable was not normally distributed, Wilcoxon rank-sum test⁹ was used to evaluate differences in intention to provide life-prolonging treatments between physicians who returned surveys with or without a DNR order. Due to the random distribution of surveys to physicians, there were no differences in the characteristics of physicians who returned surveys in which the patients had or did not have a DNR order. For this reason, an adjusted analysis was not presented in this manuscript.

The secondary outcome variables were the percent of agree/strongly agree responses to each of the 10 treatment decisions for each of the three scenarios. Chi-square tests were used to compare the percentage of physicians agreeing to initiate each therapy in the presence or absence of a DNR order.

RESULTS

Participants

Responses from 177 of 352 attending physicians and 64 of 111 medical residents (response rate 52%) were received. The majority of the respondents were male (70%), and the mean age was 43. The sample consisted of cardiologists (22%), hematologist/oncologists (16%), gastroenterologists (14%), general internists (13%), endocrinologists (7%), pulmonologists (6%), and other internal medicine subspecialists (22%). Most physicians (89%) reported taking care of at least one patient with a life expectancy of

Table 1. Characteristics of Participating Physicians

Physician Characteristic	Survey Version		P-value
	DNR Absent (n = 124)	DNR Present (n = 116)	
Age, mean	42.1	44.3	.254*
Male, %	68	74	.300†
Residents, %	53	47	.785†
>Five dying patients/month, %	27	39	.223†
Comfortable/very comfortable discussing death with patients, %	83	82	.548†

*Based on *t* tests.

†Based on chi-square tests.

DNR = do-not-resuscitate.

less than 6 months in an average month. Most physicians also reported being somewhat (42%) or very (40%) comfortable discussing issues related to death and dying with their patients. There were no differences in age, sex distribution, or comfort and experience with death and dying among those respondents who returned surveys with or without a DNR order (Table 1).

Relationship Between DNR Order and Physicians' Intentions to Provide Life Prolonging Treatments

The presence of a DNR order was negatively associated with physicians' intent to provide life-prolonging treatments not related to CPR in all three scenarios (Figure 1).

Physicians returning surveys in which Mr. M had a DNR order would initiate fewer (4.2 vs 5.0, $P = .008$) interventions than physicians returning surveys in which Mr. M did not have a DNR order. Physicians returning surveys in which Mrs. T had a DNR order would initiate fewer (6.5 vs 7.1, $P = .004$) interventions than physicians returning surveys in which Mrs. T did not have a DNR order. Finally, physicians returning surveys in which Mr. H had a DNR order would initiate fewer (5.7 vs 6.2, $P = .037$) treatment interventions than physicians returning surveys in which Mr. H did not have a DNR order.

Relationship Between DNR Order and Specific Therapeutic Interventions

The presence of a DNR order was significantly associated with a decision not to initiate 15 of 30 possible specific therapies across all three scenarios. After eliminating the decisions to perform CPR and emergency intubation, the presence of a DNR order was significantly associated with the decision to initiate nine of 24 possible therapies.

The effect of the DNR order on each specific treatment decision for the three scenarios is shown in Table 2. For Mr. M, the patient with advanced dementia and multiple myeloma, the presence of a DNR order was negatively associated with the decisions to place a central line, order a blood transfusion, perform an EGD, perform hemodialysis, transfer to the ICU, intubate, and perform CPR. For Mrs. T, the patient with metastatic breast cancer, the presence of a DNR order was negatively associated with the decisions to draw blood cultures, perform colonoscopy, transfer to the ICU, intubate, and perform CPR. For Mr. H, the presence of a DNR order was nega-

tively associated with the decisions to transfer to the ICU, intubate, and perform CPR.

Thirteen percent of physicians who returned surveys in which Mrs. T had a DNR order and 2% of physicians returning each of the surveys in which Mr. M and Mr. H had DNR orders stated that they would initiate CPR despite the presence of a DNR order. These physicians were significantly more likely to respond "agree/strongly agree" to believing that the patient would survive the cardiac arrest and leave the hospital (80% vs 10%, $P = .000$).

DISCUSSION

These results support the hypothesis that, when presented with identical patient scenarios, physicians will withhold treatments other than CPR for patients with DNR orders. Based solely on the presence of a DNR order, physicians are less likely to agree to initiate procedures ranging from complex therapies, such as ICU transfer, to simpler interventions, such as blood transfusions. These decisions should not be based on the DNR order alone. More information is needed to understand the types of treatments that a patient would or would not want to undertake.

Why are DNR orders so broadly interpreted? Patients with DNR orders are often quite ill, and physicians may assume, that because these patients have already chosen to have one life-prolonging treatment withheld, they would

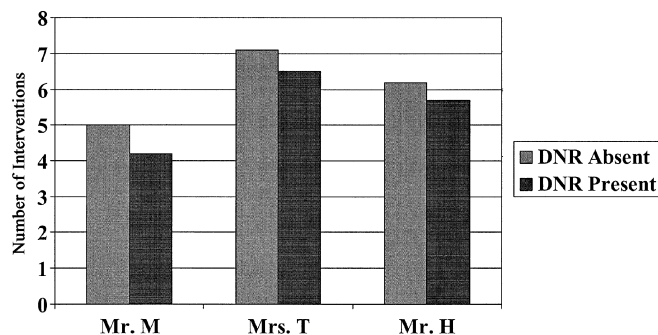


Figure 1. Number of non-cardiopulmonary resuscitation-related treatment interventions physicians agreed/strongly agreed to initiate in the presence or absence of a do-not-resuscitate (DNR) order, by patient scenario.

Table 2. Percentage of Physicians Agreeing to Initiate Specific Interventions in the Presence or Absence of a Do-Not-Resuscitate (DNR) Order

Intervention	Survey Version	
	DNR Absent	DNR Present
Mr. M		
Blood cultures	83	82
Central line	80	68*
Blood transfusion	87	75*
Computerized tomography scan	71	65
Lumbar puncture	66	63
Esophagogastroduodenoscopy	63	50*
Dialysis	20	9*
Transfer to intensive care unit	34	16 [‡]
Intubation	35	5 [‡]
Cardiopulmonary resuscitation	37	2 [‡]
Mrs. T		
Blood cultures	98	91*
Central line	92	94
Antibiotics	98	98
Bone scan	94	88
Thoracentesis	89	89
Colonoscopy	76	59 [†]
Inferior vena cava filter	79	69
Transfer to intensive care unit	75	57 [†]
Intubation	75	21 [‡]
Cardiopulmonary resuscitation	68	13 [‡]
Mr. H		
Blood cultures	98	96
Central line	93	91
Oxygen	98	99
Computerized tomography scan	76	66
Bone marrow biopsy	44	40
Bronchoscopy	94	89
Surgical consult	58	50
Transfer to intensive care unit	55	41*
Intubation	55	11 [‡]
Cardiopulmonary resuscitation	46	2 [‡]

* $P < .05$; [†] $P < .01$; [‡] $P < .001$.

wish to have other life-prolonging treatments withheld, if given the choice. Yet patients may reasonably wish only to avoid CPR but still be interested in pursuing a variety of other therapies in order to live as long as possible. Physician discomfort with death and lack of ability to communicate clearly about end-of-life decisions creates unnecessary ambiguity. Until recently, communicating with patients at the end of life has been virtually ignored as a goal in medical education. Even today, medical education about these matters typically takes place within the preclinical years in lecture halls, and few programs have formal curricula in the clinical years.¹⁰ Finally, even hospital DNR policies have been shown to be confused about the scope of a DNR order.¹¹

Several mechanisms for addressing this problem are suggested. First, physicians should discuss broad goals of therapy with patients from which more specific decisions can be negotiated depending on their likelihood of reaching

the patient's goals.^{12,13} Rather than using the treatment preferences for specific interventions as a proxy for the patient's treatment goals, it would be far better to focus on those goals themselves. When making decisions about CPR, physicians should also specifically ask about the patient's preferences for intubation in the event of worsening dyspnea or pulmonary arrest. These discussions should be noted in the chart, and the patient's goals (not simply their DNR status) should be communicated to all involved in the patient's care.

Second, physicians should be educated in the communication skills necessary to undertake these discussions and encouraged to reflect on their own experience with death. One review of clinical interventions designed to change care at the end of life found that physician education interventions led to an increase use of patient preferences,¹⁴ and another study found that an intensive ethics education improved the quality of care of patients with DNR orders.¹⁵ Attending physicians can serve as role models by communicating openly with patients and discussing patients' goals with residents and students on rounds and in conferences.

Finally, hospital policies should distinguish DNR status from palliative care and explicitly restrict the scope of interpretation of the DNR order. One early study of hospitals in Minnesota found that, although most DNR protocols distinguished DNR status from palliative care, several protocols interpreted DNR as intending palliative care or "Routine Terminal Care."¹¹ Several hospitals have attempted to address this problem by using patient care categories¹⁶ or specific treatment order forms.^{17,18} These may be useful to the extent that they are able to prompt further dialogue with patients regarding the goals of care and clarify misunderstandings among physicians.

In the study, considerable variability was found in the percentage of physicians who agreed to perform emergent intubation (from 5–21%, depending on the scenario) in the presence of a DNR order. The authors believe that this reflects the uncertainty surrounding the scope of a DNR order. In many cases, patients who request a DNR order may wish to avoid artificial respiration. In other cases, patients would be willing to undergo intubation and artificial respiration, if necessary, for a period of time in the hopes of short-term recovery. A DNR order alone does not supply this information.

It was also found that a substantial minority (13%) of physicians expressed willingness to perform CPR despite the presence of a DNR order in the scenario involving Mr. M and that 2% of physicians expressed willingness to perform CPR in each of the scenarios involving Mrs. T and Mr. H. Physicians who reported that they would resuscitate a patient with a DNR order were more likely to believe that the patient would survive the cardiopulmonary arrest and leave the hospital, despite data demonstrating that seriously ill patients rarely survive a cardiac arrest to leave the hospital.^{19–22} These results raise concerns that physicians' overestimates of patients' survival after a cardiopulmonary arrest may undermine patient preferences for treatment at this critical time. Even if a physician does believe that a patient might survive an attempted resuscitation, the patient's decision to forgo this treatment must be respected.

These results should be interpreted with several limitations in mind. First, because the patients were hypothetical, this study has not demonstrated the effect of this phenomenon on actual physician practice, yet the authors believe that there were some advantages to our research strategy. Previous studies that examined actual patients were subject to the criticism that patients with DNR orders are, in some subtle way, different from patients without DNR orders. Although physicians who received surveys in which the patients did or did not have DNR orders may have had different beliefs about patient prognosis, this research design allowed us the understanding of the isolated effect of a DNR order, because every other aspect of the patient scenario was controlled.

Second, because of the nature of the survey design, physicians had no information about the patient's preferences for treatment other than the DNR order. They were not the one who had written the initial DNR order and were not able to ask the patient for their preferences. One might argue that they used the only clue at their disposal, the DNR order, to discover the patient's wishes. It would be unfair to conclude that these physicians would not have sought further information from patients before making these decisions. Many of them probably would have, but patients are not always conscious, families are not always available, and even physicians who have patients and families at their disposal for clarification may sometimes use the DNR order as a signal of the patient's general intent. This study highlights the inadequacy of this approach.

Third, this study was conducted in only one center, a large academic urban hospital, which does not have a specific treatment order form such as those described by others.^{16–18} This may limit the generalizability of the findings to other centers. Finally, the modest response rate raises the possibility of response bias. Nevertheless, the response rate was similar to other published physician surveys.²³

In conclusion, these results raise concern that a patient who intends to forgo CPR with a DNR order may, in fact, have a variety of other treatments withheld on the basis of that one specific choice. Although physicians may reassure patients that having a DNR order will not affect other treatment decisions, our data suggest that it might. DNR orders should be used to indicate that a patient is not to be resuscitated. Further treatment limitations are often appropriate, but the patient's goals and treatment preferences should be clarified before these decisions are made.

REFERENCES

1. Rabkin MT, Gillerman G, Rice NR. Orders not to resuscitate. *N Engl J Med* 1976;295:364–366.
2. President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research. *Deciding to Forgo Life-Sustaining Treatment*. Washington, DC: U.S. Government Printing Office, 1983.
3. Council on Ethical and Judicial Affairs American Medical Association. Guidelines for the appropriate use of do-not-resuscitate orders. *JAMA* 1991;265:1868–1871.
4. Younger SJ. Do-not-resuscitate orders: No longer a secret, but still a problem. *Hastings Cent Rep* 1987;17:24–33.
5. Uhlmann RF, Cassel CK, McDonald WJ. Some treatment-withholding implications of no-code orders in an academic hospital. *Crit Care Med* 1984;12:879–881.
6. La Puma J, Silverstein MD, Stocking CB et al. Life-sustaining treatment. A prospective study of patients with DNR orders in a teaching hospital. *Arch Intern Med* 1988;148:2193–2198.
7. Bedell SE, Pelle D, Maher PL et al. Do-not-resuscitate orders for critically ill patients in the hospital. How are they used and what is their impact? *JAMA* 1986;256:233–237.
8. Holtzmann J, Phelay AM, Lurie N. Changes in orders limiting care and the use of less aggressive care in a nursing home population. *J Am Geriatr Soc* 1994;42:275–279.
9. Wilcoxon F. Individual comparisons by ranking methods. *Biometrics* 1945;1:80–83.
10. Billings JA, Block S. Palliative care in undergraduate medical education. Status report and future directions. *JAMA* 1997;278:761–763.
11. Miles SH, Moldow G. The prevalence and design of hospital protocols limiting medical treatment. *Arch Intern Med* 1984;144:1841–1843.
12. Brett AS. Limitations of listing specific medical interventions in advance directives. *JAMA* 1991;266:825–828.
13. Gillick MR. A broader role for advance medical planning. *Ann Intern Med* 1995;123:621–624.
14. Hanson LC, Tulskey JA, Danis M. Can clinical interventions change care at the end of life? *Ann Intern Med* 1997;126:381–388.
15. Sulmasy DP, Geller G, Faden R et al. The quality of mercy: Caring for patients with 'do not resuscitate orders.' *JAMA* 1992;267:682–686.
16. Davila F, Boisubin EV, Sears DA. Patient care categories: An approach to do-not-resuscitate decisions in a public teaching hospital. *Crit Care Med* 1986;14:1066–1067.
17. Mittelberger JA, Lo B, Martin D et al. Impact of a procedure-specific do not resuscitate order form on documentation of do not resuscitate orders. *Arch Intern Med* 1993;153:228–232.
18. O'Toole EE, Younger SJ, Juknialis BW et al. Evaluation of a treatment limitation policy with a specific treatment-limiting order page. *Arch Intern Med* 1994;154:425–432.
19. DeBard ML. Cardiopulmonary resuscitation—analysis of six years' experience and review of the literature. *Ann Emerg Med* 1981;14:37–38.
20. McGrath RB. In-house cardiopulmonary resuscitation—a quarter of a century. *Ann Emerg Med* 1987;16:1365–1368.
21. Bedell SE, Delbano TL, Cook EF et al. Survival after cardiopulmonary resuscitation in the hospital. *N Engl J Med* 1983;309:569–576.
22. Taffer GE, Teasdale TA, Luchi RJ. In-hospital cardiopulmonary resuscitation. *JAMA* 1988;260:2069–2072.
23. Asch DA, Jedrzewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol* 1997;50:1129–1136.