

# Advance Directives and Do-Not-Resuscitate Orders in Patients with Cancer with Metastatic Spinal Cord Compression: Advanced Care Planning Implications

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## Abstract

**Objectives:** Communication about end-of-life decisions is crucial. Although patients with metastatic spinal cord compression (MSCC) have a median survival time of 3 to 6 months, few data are available concerning the presence of advance directives and do-not-resuscitate (DNR) orders in this population. The objective of this study was to determine presence of advance directives and DNR order among patients with MSCC.

**Methods:** We retrospectively reviewed data concerning advance directives for 88 consecutive patients with cancer who had MSCC and required rehabilitation consultation at The University of Texas M. D. Anderson Cancer Center from September 20, 2005 to August 29, 2008. We characterized the data using univariate descriptive statistics and used the Fisher exact test to find correlations.

**Results:** The mean age of this patient population was 55 years (range, 24–81). Thirty patients (33%) were female. Twenty patients (23%) had a living will, 27 patients (31%) had health care proxies, and 10 patients (11%) had either out-of-hospital DNR order and/or dictated DNR note. The median survival time for these patients was 4.3 months.

**Conclusion:** Despite strong evidence showing short survival times for MSCC patients, it seems many of these patients are not aware of the urgency to have an advance directive. This may be an indicator of delayed end-of-life palliative care and suboptimal doctor–patient communication. Using the catastrophic event of a diagnosis of MSCC to trigger communication and initiate palliative care may be beneficial to patients and their families.

## Introduction

ALTHOUGH ADVANCE DIRECTIVES are codified under federal statute<sup>1</sup> and palliative care guidelines recommend that clinicians be able to discuss end-of-life goals of care,<sup>2</sup> there are no federal or state mechanisms for monitoring the implementation of do-not-resuscitate (DNR) orders. Characterizing the use of DNR orders among patients with advanced cancer has important implications for end-of-life decision-making because in the United States, the medical team is generally obliged to perform cardiopulmonary resuscitation (CPR) in the absence of a DNR order. In such a situation, only a health care proxy or a physician's declaration of medical futility may avert the obligation to perform CPR.<sup>3</sup>

One large cross-sectional study retrospectively examined a stratified sample ( $n = 16,678$ ) of all U.S. deaths in 1986 (excluding trauma and perinatal deaths) and reported living wills were in place in 9.8% of all deaths and 16.4% of cancer

deaths.<sup>4</sup> Female gender, white race, college education, income of \$22,000 or more, and poor functional status were associated with greater use of living wills.

A 1996 chart review of 200 consecutive deaths in a general hospital reported that 77% of patients had a DNR order at the time of death, but only 13% had such an order upon admission. Of patients who died after a stay of at least 3 weeks, 90% had a DNR order. Thus, hospital admission was a trigger for signing a DNR order.<sup>5</sup> The SUPPORT study reported that although 127 (39.5%) of 339 patients preferred not to receive CPR, less than half had a DNR note or order written. The median time from DNR order to death was 32 days.<sup>6</sup> Community studies have reported varying rates of advance directive use, from 29% to 91%, depending on the setting and the patients' ages.<sup>7–10</sup>

Approximately 12,700 patients with cancer in the United States develop metastatic spinal cord compression (MSCC) each year, which puts them at risk for pain, paraparesis or

paralysis, incontinence, and institutionalization.<sup>11</sup> MSCC usually occurs when the cancer is widespread, and large retrospective studies have found that the median survival time for patients with MSCC is 3 to 6 months.<sup>11,12</sup> Median survival time after spinal cord compression depends on each patient's tumor type and ambulatory status and on the number and site(s) of metastases.<sup>12-15</sup> Patients with a single metastasis, a radiosensitive tumor, or myeloma, breast, or prostate cancer have the longest median survival times,<sup>16-19</sup> while patients with multiple metastases, visceral or brain metastases, or lung or gastrointestinal cancers have the shortest.<sup>16,17,20</sup> Even patients with typically chemoresponsive and radioresponsive tumors have relatively short median survival times; for instance, patients with myeloma, lymphoma, and breast cancer have median survival times of 6.4, 6.7, and 5.0 months, respectively; the median survival times of patients with prostate and lung cancer, which tend not to be responsive, are only 4.0 and 1.5 months, respectively.<sup>11</sup> One-year survival rates for patients with spinal cord compression due to multiple myeloma, lymphoma, breast cancer, and prostate cancer were 39%, 38%, 27%, and 22%, respectively, while that of lung cancer patients was 4%.<sup>11</sup> In retrospective and prospective observational studies, median survival times for patients who could walk after the completion of therapy ranged from 7.9 to 9.0 months, but the median survival times for non-ambulatory patients were only 1 to 2 months.<sup>17,21,22</sup> In our previous study of patients with MSCC, the median survival time was 4.1 months.<sup>23</sup>

The use of advance directives in patients with MSCC and functional decline has not been previously studied. The purpose of the present study was to assess the frequency of advance directives such as health care proxies, living wills, and DNR orders in patients who had been diagnosed with MSCC and who required a physical medicine and rehabilitation (PM&R) consultation. This information may help us to understand whether the diagnosis of MSCC can serve as a reminder for oncologists to initiate conversations about end-of-life decisions and introduce timely palliative care planning.

## Methods

### Setting and subjects

The study was conducted at M. D. Anderson Cancer Center in Houston, Texas. The retrospective study included 88 consecutive patients who had MSCC and required a physical medicine and rehabilitation consultation from September 20, 2005, to August 29, 2008. One patient was excluded from analysis because she was less than 18 years old.

### Study design

This study was approved by our Institutional Review Board. We reviewed the electronic medical records of the 87 patients and recorded each patient's age, gender, race, religion, functional status, and tumor type, along with the number of spinal metastases (multiple versus single) and the status of visceral metastases and/or brain metastases (present versus absent). We reviewed the advance directive admission inquiry and recorded whether the patient had a living will, medical power of attorney/health care proxy, or out-of-hospital DNR order prior to the PM&R consultation date. The out-of-hospital DNR order could be present even when there was no dictated DNR note by an oncologist/physician in

our institution; for example, a patient might have had an oncologist/physician outside of our institution sign an out-of-hospital DNR order. We also reviewed the DNR note prior to PM&R consult. If a DNR order was issued in our institution, we extracted from the medical record the date on which the DNR note was dictated. It is our institutional policy to dictate a DNR note at the same time a DNR order is written.

### Statistical methods

To characterize our patient population, we generated univariate descriptive statistics. We then summarized the data by gender, race, and age and used the Fisher exact test to determine whether differences in advanced care planning were associated with patients' demographic characteristics. We chose to compare patients aged less than 65 years to those aged 65 years and older because a previous study found that a higher percentage of people over age 65 had living wills compared to younger adults.<sup>9</sup> Another study at the Mayo Clinic showed that the median age at the time patients signed their respective advance directives was 67 years.<sup>24</sup> We used descriptive statistics to calculate the median number of days between the physical medicine and rehabilitation consultation and death and between the date when a physician dictated a DNR note and death. A *p* value less than 0.05 is considered significant.

## Results

### Demographic data

The mean age of the patients at the time of their physical medicine and rehabilitation consultation was 55 (range, 24-81) years, and 29 (33%) were female (Table 1). At the time of their PM&R consultation, 20 patients (23%) reported having a living will, 27 patients (31%) reported having identified a health care proxy, 5 patients (6%) reported having an out-of-hospital DNR order, 8 patients (9%) had a dictated DNR note, including 3 patients who had both an out-of-hospital DNR order and a dictated DNR note. All the patients had impaired function, with 72 patients (83%) requiring assistance for walking and 54 (62%) requiring acute rehabilitation. These patients had advanced disease: all patients had MSCC, 72 (83%) had multiple spinal metastases, 18 (21%) had brain metastases, and 42 (48%) had visceral metastases.

Fifty-nine (68%) of the 87 patients had died at the time of the study. The median survival time of the patients, calculated from the date the PM&R physician was consulted to the date of death, was 129 days (4.3 months). Twenty-six (44%) of the 59 patients who died had DNR orders issued at our institution, as indicated by a physician-dictated DNR note; the median time from the date of the physician-dictated DNR note to the date of death was 16.5 days (first quartile = 6.5 days; third quartile = 38.3 days).

### Frequency of advanced care planning in different subgroups

Table 2 summarizes the advance care planning by race/ethnic group. The presence of a living will appeared to be more frequent for Asians/Pacific Islanders and whites, less frequent for African Americans/blacks, and least frequent for Hispanics/Latinos. The same trend was seen in the presence of a health care proxy and an out-of-hospital DNR order;

TABLE 1. PATIENT CHARACTERISTICS (N=87)

Characteristic	n (%)
Mean age ± SD, years	55.3 ± 14
Female gender	29 (33)
Race/ethnic group	
Asian/Pacific Islander	3 (3)
African American/black	15 (17)
Hispanic/Latino	18 (21)
White	51 (59)
Primary cancer diagnosis	
Breast	10 (11)
Gastrointestinal	6 (7)
Head and neck	5 (6)
Lung	10 (11)
Lymphoma	8 (9)
Melanoma	4 (5)
Prostate	10 (11)
Renal	15 (17)
Sarcoma	7 (8)
Other	13 (15)
Advance care planning	
Living will	20 (23)
Health care proxy	27 (31)
Out-of-hospital DNR order	5 (6)
Requiring assistance for ambulation	72 (83)
Requiring acute rehabilitation	54 (62)
Brain metastasis	18 (21)
Multiple spinal metastases	72 (82)
Visceral metastasis	42 (48)

SD, standard deviation; DNR, do not resuscitate.

however, none of the between-group differences was significant.

Table 3 summarizes the advance care planning by age. Although the presence of living wills and health care proxies appeared to be more frequent in patients aged 65 years or older than in those younger than 65, the differences were not significant. The rates of out-of-hospital DNR orders were similar in both age groups.

**Discussion**

To the best of our knowledge, this is the first analysis of advance directive and DNR trends in a specific patient group. Despite the well-documented median survival time of 3 to 6 months in this patient population,<sup>11,15,23</sup> only 20 patients (23%) reported having a living will, 27 patients (31%) reported having identified a health care proxy, 5 (6%) patients reported having an out-of-hospital DNR, and 8 (9%) had a DNR order.

Among the 59 patients who had died, 26 (46%) had a DNR note and for those who did, the median time between the date of the DNR note and death was 16.5 days. This low frequency of presence of advance directives and the short interval between DNR order and death indicate the need to improve doctor-patient communication regarding end-of-life goals of care.

Prognostication is crucial to initiating discussions about end-of-life care. Prognostication can empower decision making but may be anxiety-provoking for both physicians and patients. Overly optimistic prognostication often occurs, ironically, when physicians know their patients better.<sup>25</sup> This close relationship may cause procrastination and lead to delay in end-of-life discussions. Lunney et al.<sup>26</sup> noted a sharp functional decline, called the dying trajectory, in patients with cancer 3 months before death occurred. The obvious decline in function for patients with MSCC may serve as a tool for more accurate prognostication and should alert the oncologist to initiate an advance care planning discussion.

When a dying patient's family members have more time to prepare for the loss, they are less likely to suffer complicated grief during the bereavement process.<sup>27</sup> The proxy's signing of an advance directive is exceptionally stressful. Azoulay et al.<sup>28</sup> showed that when patients died in intensive care units after end-of-life decisions had been made, 60% of relatives developed marked posttraumatic symptoms, and among those relatives who shared in end-of-life decisions, 82% developed these symptoms. Increasing the interval between the initiation of an advance care planning discussion and the patient's death might be one concrete way to diminish the surrogate's potential suffering from his or her decision-making responsibilities.<sup>29</sup> Our patient population's median time between the date when the rehabilitation team was consulted and the date of death was 129 days (4.3 months), well within the hospice care criteria of a life expectancy of 6 months or less. This time frame would allow for adequate time for family members to prepare for their loss if end-of-life discussions are introduced when a patient is diagnosed with MSCC.

We found that both African Americans/blacks and Hispanics/Latinos tended to have lower advance care planning rates than those of whites and Asians/Pacific Islanders, which is consistent with a research report from a decade ago that showed African American/black race was associated with low rates of DNR orders.<sup>4</sup> The differences between our patient groups were not significant, but we believe this may be a result of our limited sample size. A previous report on a telephone survey of randomly chosen adults in Hawaii (n = 700) found that 29% had a living will, but this increased to 62% in the over-65 age group.<sup>9</sup> We also found a trend toward

TABLE 2. ADVANCE CARE PLANNING BY RACE/ETHNIC GROUP

Advance care planning	n (%)				p
	Asian/Pacific Islander (n = 3)	African American/Black (n = 15)	Hispanic/Latino (n = 18)	White (n = 51)	
Living will	1 (33)	3 (20)	2 (11)	14 (27)	0.47
Health care proxy	2 (67)	3 (20)	3 (17)	19 (37)	0.14
Out-of-hospital DNR order	0	0	1 (6)	4 (8)	0.85

DNR, do not resuscitate.

TABLE 3. ADVANCE CARE PLANNING BY AGE

Advance care planning	n (%)		P
	<65 years (n = 66)	≥65 years (n = 22)	
Living will	13 (20)	7 (32)	0.24
Health care proxy	19 (29)	8 (36)	0.53
Out-of-hospital DNR order	4 (6)	1 (5)	>0.99

DNR, do not resuscitate.

a higher frequency of living wills and health care proxies among patients aged 65 years and older than among younger patients, but the difference was much smaller than in previous reports and was not significant. There was no difference in out-of-hospital DNR order frequency between the 2 age groups. Another study at a large, tertiary care, urban, academic medical center showed patients who had advance directives were older and considered themselves less healthy than did those without advance directives.<sup>30</sup> The lack of association between advance directives and patients' age and diagnosis of advanced cancer in our study may be related to the patient population. The patients who choose to seek care in a comprehensive cancer center may have different attitudes and beliefs regarding advance care planning than those who do not. Further study is needed to compare the patients with MSCC in comprehensive cancer centers to those patients receiving oncology care in the community.

This study contains several limitations. First, because M. D. Anderson is a comprehensive care center, selection bias may limit the generalizability of our findings on the frequency of advance directives. However, because the survival of MSCC patients in all settings has been well documented, the use of MSCC events to initiate end-of-life conversations is still valid. Second, we had a limited sample size. In a future study with a larger sample size, we may be able to identify specific patient groups associated with lower advance directive and DNR order rates.

In conclusion, the median survival time of MSCC patients is known as 3 to 6 months.<sup>11,13,23</sup> This is again confirmed in our study (4.3 months). These data suggest that a catastrophic event such as MSCC can be used for prognostication and can prompt physicians to initiate a clinical pathway for a palliative consultation and to initiate a discussion about end-of-life care.

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### Author Disclosure Statement

No competing financial interests exist.

### References

1. Patient Self-determination Act. 42 USC §1395cc(f). 1992.
2. National Consensus Project for Quality Palliative Care: Clinical practice guidelines for quality palliative care. New York: National Consensus Project for Quality Palliative Care, 2004.
3. Creation and Use of Proxies in Residential Health Care and Mental Hygiene Facilities. N.Y. Public §2991. 1993.
4. Hanson LC, Rodgman E: The use of living wills at the end of life. A national study. *Arch Intern Med* 1996;156:1018-1022.
5. Fins JJ, Miller FG, Acres CA, Bacchetta MD, Huzzard LL, Rapkin BD: End-of-life decision-making in the hospital: current practice and future prospects. *J Pain Symptom Manage* 1999;17:6-15.
6. Haidet P, Hamel MB, Davis RB, Wenger N, Reding D, Kussin PS, Connors AF Jr, Lynn J, Weeks JC, Phillips RS: Outcomes, preferences for resuscitation, and physician-patient communication among patients with metastatic colorectal cancer. SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments. *Am J Med* 1998;105:222-229.
7. Kahana B, Dan A, Kahana E, Kercher K: The personal and social context of planning for end-of-life care. *J Am Geriatr Soc* 2004;52:1163-1167.
8. Solloway M, LaFrance S, Bakitas M, Gerken M: A chart review of seven hundred eighty-two deaths in hospitals, nursing homes, and hospice/home care. *J Palliat Med* 2005; 8:789-796.
9. Braun KL, Onaka AT, Horiuchi BY: Advance directive completion rates and end-of-life preferences in Hawaii. *J Am Geriatr Soc* 2001;49:1708-1713.
10. Oh DY, Kim JH, Kim DW, Im SA, Kim TY, Heo DS, Bang YJ, Kim NK: CPR or DNR? End-of-life decision in Korean cancer patients: A single center's experience. *Support Care Cancer* 2006;14:103-108.
11. Loblaw DA, Laperriere NJ, Mackillop WJ: A population-based study of malignant spinal cord compression in Ontario. *Clin Oncol (R Coll Radiol)* 2003;15:211-217.
12. Rades D, Fehlaue F, Schulte R, Veninga T, Stalpers LJ, Basic H, Bajrovic A, Hoskin PJ, Tribius S, Wildfang I, Rudat V, Engenhart-Cabilic R, Karstens JH, Alberti W, Dunst J, Schild SE: Prognostic factors for local control and survival after radiotherapy of metastatic spinal cord compression. *J Clin Oncol* 2006;24:3388-3393.
13. Rades D, Heidenreich F, Karstens JH: Final results of a prospective study of the prognostic value of the time to develop motor deficits before irradiation in metastatic spinal cord compression. *Int J Radiat Oncol Biol Phys* 2002;53:975-979.
14. Kim RY, Spencer SA, Meredith RF, Weppelmann B, Lee JY, Smith JW, Salter MM: Extradural spinal cord compression: Analysis of factors determining functional prognosis—Prospective study. *Radiology* 1990;176:279-282.
15. Loblaw DA, LaPierre NJ: Emergency treatment of malignant extradural spinal cord compression: an evidence-based guideline. *J Clin Oncol* 1998;16:1613-1624.
16. Schiff D: Spinal cord compression. *Neurol Clin* 2003;21: 67-86.
17. Helweg-Larsen S, Sorensen PS, Kreiner S: Prognostic factors in metastatic spinal cord compression: A prospective study using multivariate analysis of variables influencing survival and gait function in 153 patients. *Int J Radiat Oncol Biol Phys* 2000;46:1163-1169.
18. Bauer HC, Wedin R: Survival after surgery for spinal and extremity metastases: prognostication in 241 patients. *Acta Orthop Scand* 1995;66:143-146.
19. Sioutos PJ, Arbit E, Meshulam CF, Galicich JH: Spinal metastases from solid tumors: analysis of factors affecting survival. *Cancer* 1995;76:1453-1459.

20. Sundaresan N, Sachdev VP, Halland JF, Moore F, Sung M, Paciucci PA, Wu LT, Kelligher K, Hough L: Surgical treatment of spinal cord compression from epidural metastasis. *J Clin Oncol* 1995;13:2330–2335.
21. Maranzano E, Latini P: Effectiveness of radiation therapy without surgery in metastatic spinal cord compression: Final results from a prospective trial. *Int J Radiat Oncol Biol Phys* 1995;32:959–967.
22. Maranzano E, Bellavita R, Rossi R, De Angelis V, Frattegiani A, Bagnoli R, Mignogna M, Beneventi S, Lupattelli M, Ponticelli P, Biti GP, Latini P: Short-course versus split-course radiotherapy in metastatic spinal cord compression: Results of a phase III, randomized, multicenter trial. *J Clin Oncol* 2005;23:3358–3365.
23. Guo Y, Young B, Palmer JL, Mun Y, Bruera E: Prognostic factors for survival in metastatic spinal cord compression: A retrospective study in a rehabilitation setting. *Am J Phys Med Rehabil* 2003;82:665–668.
24. Nishimura A, Mueller PS, Evenson LK, Downer LL, Bowron CT, Thieke MP, Wroblewski DM, Crowley ME: Patients who complete advance directives and what they prefer. *Mayo Clin Proc* 2007;82:1480–1486.
25. Christakis NA: *Death Foretold. Prophecy and Prognosis in Medical Care*. Chicago: University of Chicago Press, 1999.
26. Lunney JR, Lynn J, Foley DJ, Lipson S, Guralnik JM: Patterns of functional decline at the end of life. *JAMA* 2003;289:2387–2392.
27. Barry LC, Kasl SV, Prigerson HG: Psychiatric disorders among bereaved persons: The role of perceived circumstances of death and preparedness for death. *Am J Geriatr Psychiatry* 2002;10:447–457.
28. Azoulay E, Pochard F, Kentish-Barnes N, Chevret S, Aboab J, Adrie C, Annane D, Bleichner G, Bollaert PE, Darmon M, Fassier T, Galliot R, Garrouste-Orgeas M, Goulenok C, Goldgran-Toledano D, Hayon J, Jourdain M, Kaidomar M, Laplace C, Larché J, Liotier J, Papazian L, Poisson C, Reignier J, Saidi F, Schlemmer B; FAMIREA Study Group: Risk of post-traumatic stress symptoms in family members of intensive care unit patients. *Am J Respir Crit Care Med* 2005;171:987–994.
29. Weiner JS, Roth J: Avoiding Iatrogenic harm to patient and family while discussing goals of care near the end of life. *J Palliat Med* 2006;9:451–463.
30. Elpern EH, Yellen SB, Burton LA: A preliminary investigation of opinions and behaviors regarding advance directives for medical care. *Am J Crit Care* 1993;2:161–167.

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