

Factors Associated with Discussion of Care Plans and Code Status at the Time of Hospital Admission: Results from the Multicenter Hospitalist Study

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BACKGROUND: Hospital admission is a time when patients are sickest and also often encountering an entirely new set of caregivers. As a result, understanding and documenting a patient's care preferences at hospital admission is critically important.

OBJECTIVE: To understand factors associated with documentation of care planning discussions in patients admitted to general medical services at 6 academic medical centers.

DESIGN: Observational cohort study using data collected during the Multicenter Hospitalist Study, conducted between July 1, 2002 and June 30, 2004.

SETTING: Prospective trial enrolling patients admitted to general medicine services at 6 university-based teaching hospitals.

PATIENTS: Patients were eligible for this study if they were 18 years of age or older, admitted to a hospitalist or nonhospitalist physician, and able to give informed consent.

MEASUREMENTS: Presence of chart documentation that the admitting team had discussed care plans with the patient within the first 24 hours of hospitalization. Notations such as "full code" were not counted as a discussion, whereas notations such as "discussed care wishes and plan with patient" were counted.

RESULTS: A total of 17,097 patients over the age of 18 gave informed consent and completed an interview and chart abstraction; of these, 1776 (10.3%) had a code status discussion (CD) documented in the first 24 hours of their admission. Patients with a CD were older (69 years vs. 56 years, $P < 0.0001$), more often white (52.8% vs. 43.3%, $P < 0.0001$), and more likely to have cancer (19.8% vs. 11.4%, $P < 0.0001$), or depression (35.1% vs. 30.9%, $P < 0.0001$). There was marked variability in CD documentation across sites of enrollment (2.8%-24.9%, $P < 0.0001$). Despite strong associations seen in unadjusted comparisons, in multivariable models many socioeconomic factors, functional status, comorbid illness, and documentation of a surrogate decision maker were only moderately associated with a CD (adjusted odds ratios all less than 2.0). However, patients' site of enrollment (odds ratios 1.74-5.14) and informal notations describing prehospital care wishes (eg, orders for "do not resuscitate"/"do not intubate;" odds ratios 3.22-11.32 compared with no preexisting documentation) were powerfully associated with CD documentation. Site remained a powerful influence even in patients with no documented prehospital wishes.

LIMITATIONS: Our results are derived from a relatively small number of academic sites, and we cannot connect documentation differences to differences in patient outcomes.

CONCLUSIONS: Documentation of a CD at admission was more strongly associated with informal documentation of prehospital care wishes and where the patient was hospitalized than legal care planning documents (such as durable power of attorney), or comorbid illnesses. Efforts to improve communication between hospitalists and their patients might target local documentation practices and culture. *Journal of Hospital Medicine* 2008;3(6):437-445. © 2008 Society of Hospital Medicine.

KEYWORDS: care discussion, hospital admission, patient care planning.

Despite an ideal of dying at home, most Americans die in hospitals.¹ Patients and families are clear about what they need from the healthcare system at the end of life: relief of distressing symptoms, the opportunity to communicate with physicians and others about death and dying, and the assurance that they will be attended to and comforted by their physicians as they approach death.^{2,3} However, discussions about patient preferences for care occur infrequently,⁴⁻⁷ even though patients want to discuss care with their doctor,⁶⁻⁸ and physicians believe these discussions are their responsibility.⁹

The most prominent work in this area occurred in the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments (SUPPORT) study, which focused on patients with advanced disease, often in the intensive care unit.⁴ Furthermore, few studies have focused on general medical patients, and healthcare has changed in important ways since SUPPORT's publication. First, the Patient Self-Determination Act (PSDA) requires that all patients be asked about their care wishes at the time of admission and document the presence of an advanced directive.^{10,11} Second, there is growing awareness of the need to improve palliative care for all hospitalized patients, with many advocating that hospitalization itself is a reason to ask about patient's preferences for care regardless of a patient's level of chronic or acute illness.¹² Finally, emergence of hospitalists,¹³⁻¹⁶ movement toward "closed" intensive care units,^{17,18} and changes in residency training have increased segmentation in care of hospitalized patients.^{15,18}

To overcome limitations of previous literature and update our knowledge of how care discussions take place in the current healthcare environment, we analyzed data from a large study of patients admitted to general medicine services at 6 academic centers. Using this robust dataset, which included prospectively collected information about preferences for communication with their physician, we performed statistical analyses to understand which patient clinical, sociodemographic, and preference-related factors, as well as factors related to their site of care, were associated with documentation that a code status discussion took place at the time of hospital admission.

PATIENTS AND METHODS

Sites

The Multicenter Hospitalist Study (MCHS) was a multicenter trial of general medical services that enrolled patients at 6 geographically diverse centers: The University of Chicago (which also served as the coordinating center), University of Iowa Hospitals and Clinics, University of California San Francisco, University of Wisconsin, University of New Mexico, and Brigham and Women's Hospital.¹⁹

Each site was selected to participate in the MCHS because patients on their general medicine service were admitted to hospitalist and nonhospitalist physicians in a random fashion (eg, based on predetermined call schedule based on day of the week). As teaching hospitals, house officers provided direct care to patients hospitalized at each center; nonteaching services were not present at the sites during the period of this study.

During the period of this study, each site complied with PSDA requirements for noting that patients had been informed about their right to create an advance directive, but no sites had a guideline or other program in place specifically intended to facilitate physician-patient communication about care wishes. Two sites had active Hospice or Palliative Care services, and another 2 had Geriatrics Consultation services, but none had standard protocols mandating involvement of these consultants at the time of admission, the time when our key outcomes were documented.

Patients

Patients were eligible for inclusion in the MCHS if they were older than 18 years of age and were admitted at random to a hospitalist or nonhospitalist physician; we excluded patients from MCHS if they were admitted specifically under the care of their primary care physician or subspecialist (eg, admitted for chemotherapy) or were a prison inmate. Patients meeting these eligibility criteria were then approached for purposes of informed consent.

Data Collection

Data for this study were obtained from administrative data, patient interview, and chart abstraction as in previous work.¹⁴ Administrative data were drawn from cost-accounting databases at each participating hospital; administrative data

were used to provide cost and length of stay data, as well as information about patient insurance type, age, and sex.

We interviewed patients immediately after informed consent was obtained, with both taking place generally within 24 hours of admission. Interviews collected data about patient preferences for care and functional status,²⁰ and other data not reliably available from administrative sources (such as housing situation).

Patient care plan before admission was taken from notes and orders written in the first 24 hours of hospitalization, as mentioned above. Using criteria we employed in previous work,²¹ a care discussion (CD) was defined as documentation of a discussion between patients (or family) and at least 1 physician (primary physician, hospitalist, consulting physician, or house officer) during the first 24 hours of hospitalization. CDs needed to specify that the person who wrote the note had actually spoken with the patient or their family for the purposes of determining preferences for care, and that this discussion resulted in a specific care plan. Thus, notations such as “do not resuscitate”/“do not intubate,” or “spoke with family, questions answered,” did not qualify as CDs, but a note stating “the patient continues to want full efforts” was counted as a CD.

Principal investigators at each site were responsible for training and overseeing interviewing and chart abstraction activities at each site, with central oversight of data quality provided by the central coordinating center. Upon receipt at the data coordinating center, all data were examined for missing, nonsensical, or outlier data with errors referred back to the participating sites for correction.

Statistical Analysis

For bivariable comparisons of patients with and without CDs, we used chi-squared or Mann-Whitney U-tests, as appropriate.

Variables with $P < 0.20$ in bivariable comparisons were selected for initial inclusion in models. Then, using automated forward and stepwise selection techniques as well as manually entered variables, we fit multivariable generalized estimating equations permitting clustering of effects at the physician level to determine the independent association between the multiple factors tested and presence of a CD. In order to guard against

the threat of multiple testing, we retained variables at a significance level of $P < 0.01$; variables were also retained because of observed confounding with other independent variables, or to maintain face validity of the model. All analyses were performed using SAS 9.0 for Windows (SAS Institute Inc., Cary, NC).

RESULTS

Patient Sociodemographics (Table 1)

A total of 17,097 of 33,638 patients (50.8%) were interviewed and gave consent for chart abstraction. Of these patients, 1776 (10.3%) had a CD documented in the first 24 hours of hospitalization. Patients with documented CDs were older, more often white, had completed more years of education, were more likely to have lived in a nursing home prior to admission, and more likely to have been hospitalized in the last 12 months. The proportion of patients with CDs was highly variable across site of enrollment, from 2.8%-24.9%.

Patient Self-Reported Health Status and Comorbid Illness (Table 2)

Patients with CDs more often reported a lot of difficulties with bathing, eating, or dressing; household chores; and moderate activities. Patients with CDs were more likely to report accomplishing less than they would like due to their health. They were more likely to have cancer, depression, a history of stroke, and heart disease, but less likely to have diabetes or human immunodeficiency virus.

Patient Preferences, Care Plan Documentation, and Care Coordination at Admission (Table 3)

Patients who had documented CDs were less likely to “prefer my doctor give me choices regarding my care,” and more often disagreed with the statement “I prefer to leave care decisions to my physician.” These patients were also more likely to have a durable power of attorney or living will in their chart, or have an alternate decision-maker noted. The majority of patients without a documented CD (79.9%) had no notation of their care wishes, compared to 29.7% in patients with a documented CD. Patients with a documented CD were more likely to have a regular medical provider and a note in the chart from their primary care physician.

TABLE 1
Patient Sociodemographics (total n = 17097)

Value	No Documented CD (n = 15321, 89.7%)	Documented CD (n = 1776, 10.3%)	P*
Age (Median, 95%CI)*	56 (55, 56)	69 (67, 71)	< 0.0001
Female (n, %)	8390 (54.8%)	990 (55.7%)	0.4312
Race (n, %)			
White	6640 (43.3%)	938 (52.8%)	< 0.0001
African American	4673 (30.5%)	280 (15.8%)	
Asian	532 (3.5%)	167 (9.4%)	
American Indian	325 (2.1%)	26 (1.5%)	
Other	1951 (12.7%)	241 (13.6%)	
Refused/Don't know	1200 (7.8%)	124 (7.0%)	
Ethnicity (n, %)			
Hispanic or Latino Ethnicity	1724 (11.3%)	183 (10.3%)	0.0039
Insurance type (n, %)			
Charity	481 (3.4%)	14 (0.8%)	< 0.0001
Indemnity	3983 (28.2%)	327 (19.3%)	
Medicaid	2487 (17.6%)	195 (11.5%)	
Medicare	6418 (45.5%)	1114 (65.9%)	
Other	105 (0.7%)	4 (0.2%)	
Self pay	628 (4.5%)	36 (2.1%)	
Self-reported education (n, %)			
Junior high school or less	1297 (8.5%)	217 (12.2%)	< 0.0001
Some high school	2146 (14.0%)	182 (10.2%)	
High school graduate	4435 (28.9%)	465 (26.2%)	
Some college or junior college	3521 (23.0%)	347 (19.5%)	
College graduate	1729 (11.3%)	255 (14.4%)	
Post-graduate	1191 (7.8%)	173 (9.7%)	
Refused/Don't know	1002 (6.5%)	137 (7.7%)	
Self reported income (n, %)			
\$2,500 or less	1079 (7.0%)	108 (6.1%)	0.0002
\$2,501 to \$5,000	424 (2.8%)	33 (1.9%)	
\$5,001 to \$10,000	1436 (9.4%)	211 (11.9%)	
\$10,001 to \$15,000	1080 (7.0%)	141 (7.9%)	
\$15,001 to \$25,000	1054 (6.9%)	134 (7.5%)	
\$25,001 to \$35,000	837 (5.5%)	74 (4.2%)	
\$35,001 to \$50,000	882 (5.8%)	94 (5.3%)	
\$50,001 to \$100,000	1027 (6.7%)	125 (7.0%)	
\$100,001 to \$200,000	357 (2.3%)	57 (3.2%)	
Over \$200,000	245 (1.6%)	34 (1.9%)	
Don't know/refused	6900 (45.0%)	765 (43.1%)	
Housing situation (n, %)			
Own apartment or house	11887 (77.6%)	1264 (71.2%)	< 0.0001
A relative or friend's apartment or house	1804 (11.8%)	217 (12.2%)	
A nursing home, group home, or long-term care facility	663 (4.3%)	204 (11.5%)	
A homeless shelter	258 (1.7%)	27 (1.5%)	
Other	709 (4.6%)	64 (3.6%)	
Marital status (n, %)			
Married	4992 (32.6%)	603 (34.0%)	< 0.0001
Living as if married	440 (2.9%)	32 (1.8%)	
Divorced	2027 (13.2%)	199 (11.2%)	
Separated	569 (3.7%)	30 (1.7%)	
Widowed	2577 (16.8%)	487 (27.4%)	
Single	4074 (26.6%)	364 (20.5%)	
Refused	642 (4.2%)	61 (3.4%)	

TABLE 1
(continued)

Value	No Documented CD (n = 15321, 89.7%)	Documented CD (n = 1776, 10.3%)	P*
Hospitalized in the last 12 months (n, %)	7602 (49.6%)	1011 (56.9%)	< 0.0001
Site of enrollment (n, %)			
A	4602 (30.0%)	135 (7.6%)	< 0.0001
B	1595 (10.4%)	158 (8.9%)	
C	3017 (19.7%)	998 (56.2%)	
D	2387 (15.6%)	212 (11.9%)	
E	2057 (13.4%)	131 (7.4%)	
F	1663 (10.9%)	142 (8.0%)	

*P value from Mann-Whitney U Test, all others from chi-squared tests.
Totals may not sum to 100% due to rounding.

Factors Associated with Documented Care Discussions (Table 4)

Using predictor variables presented in Tables 1-3, we then constructed multivariable models seeking to understand factors independently associated with documentation of code status in the entire cohort, as well as among patients who had no preexisting care wishes.

In the entire cohort, insurance type was independently associated with likelihood of a care discussion, with patients with Medicare having greater adjusted odds ratio for a CD than patients with all other forms of insurance, even after adjusting for age. Patients who had functional limitations with bathing, toileting, and feeding; had a documented surrogate decision maker; were unable to participate in their care; had cancer; or did not live in their own home were more likely to have a documented CD. Subjects with diabetes were less likely to have a CD, although this was of borderline significance. Patients whose team had documented a CD with the patients' primary physician were also more likely to have a discussion noted. However, the magnitude of these predictors was small compared to the independent effects attributable to the site the patient was enrolled or whether the patient had any preexisting documentation. Whereas the adjusted odds ratio associated with clinical or functional measures (such as age, cancer) were generally between 1.5 and 2.5, the range of odds ratios associated with having any documentation of care wishes (compared to no documentation) were all greater than 3, and the

TABLE 2
Patient Self-Reported Health Status and Comorbid Disease (Total n = 17097)*

Value	No Documented CD (n = 15321, 89.7%)	Documented CD (n = 1776, 10.3%)	P**
Thinking back again to one month ago, did any impairment or health problem cause you to need help of other persons with personal care needs, such as eating, bathing, dressing, or getting around the home? (n, %)			
No	10673 (69.7%)	973 (54.8%)	< 0.0001
Yes, a little	1933 (12.6%)	268 (15.1%)	
Yes, a lot	2127 (13.9%)	487 (27.4%)	
Don't know	588 (3.8%)	48 (2.7%)	
Thinking back to one month ago, did any impairment or health problem cause you to need help in handling everyday household chores, necessary business, shopping, or getting around for other purposes? (n, %)			
No	7262 (47.4%)	566 (31.9%)	< 0.0001
Yes, a little	2692 (17.6%)	324 (18.2%)	
Yes, a lot	4126 (26.9%)	825 (46.5%)	
Don't know	1241 (8.1%)	61 (3.4%)	
As far as you know do you have any of the following health conditions at the present time? (n, %)			
Cancer			
No	13281 (86.7%)	1376 (77.5%)	< 0.0001
Yes	1751 (11.4%)	351 (19.8%)	
Not sure	289 (1.9%)	49 (2.8%)	
Depression			
No	10269 (67.0%)	1099 (61.9%)	< 0.0001
Yes	4730 (30.9%)	624 (35.1%)	
Not sure	322 (2.1%)	53 (3.0%)	
Diabetes			
No	10902 (71.2%)	1356 (76.4%)	< 0.0001
Yes	4132 (27.0%)	394 (22.2%)	
Not sure	287 (1.9%)	26 (1.5%)	
Heart trouble			
No	10251 (66.9%)	1080 (60.8%)	< 0.0001
Yes	4491 (29.3%)	627 (35.3%)	
Not sure	579 (3.8%)	69 (3.9%)	
HIV or AIDS			
No	14300 (93.3%)	1679 (94.5%)	0.026
Yes	912 (6.0%)	80 (4.5%)	
Not sure	109 (0.7%)	17 (1.0%)	
Stroke			
No	13344 (87.1%)	1494 (84.1%)	0.0005
Yes	1722 (11.2%)	236 (13.3%)	
Not sure	255 (1.7%)	46 (2.6%)	

*Self reported data collected at time of intake interview, performed within 24 hours of admission.

**Calculated using chi-squared tests.

Totals may not sum to 100% due to rounding.

odds ratios associated with site of enrollment were 1.7 or higher.

We observed similar findings in analyses limited to patients with no preexisting care documentation. While clinical, sociodemographic, and functional factors remained statistically associated with a CD (albeit with wider confidence intervals

due to smaller sample sizes), the effect of the patient's site of enrollment became even more striking (Table 4).

DISCUSSION

In this multicenter study of hospitalized general medical patients, documentation of CDs were highly dependent on where patients received care and whether patients had previous documentation of a care plan. In contrast, although clinical, prognostic, and socioeconomic factors were also associated with whether physicians documented asking patients about their wishes for care, the influence of these factors was modest.

Improving communication between patients and their physicians during an episode of acute illness has been a long-standing goal, with the Study to Understand Prognoses and Preferences for Outcomes of Treatment (SUPPORT) trial providing the most notable example of an effort to improve patient care through aligning patient wishes, prognosis, and aggressiveness for care. However, even the SUPPORT intervention—a robust, well-implemented, and highly labor-intensive strategy—was not able to achieve this goal. In their summary of SUPPORT study findings, the authors suggested that the likelihood of and effectiveness of communication in seriously ill patients may be powerfully influenced by patient and caregiver culture⁴; our findings may partially confirm SUPPORT's conclusions.

Preexisting documentation in our study would not have included mandated documentation that someone had given the patient information about advance directives (as mandated by the PSDA), but rather a specification for that advance care plan. This distinction means that preexisting documentation in our study represented a previous decision by the patient (or the patient and their physician) to have made a plan, and an association with hospital discussions may be because the first conversation is the hardest to undertake; subsequent discussions then represent confirmatory or clarifying discussions that may be less difficult to broach (particularly for less experienced trainees). A CD may have also been prompted when documentation was unclear, or when a change in prognosis took place (eg, a new diagnosis of metastatic cancer).²² Alternatively, a preexisting plan may serve as a reminder for clinicians to discuss code status, signify patients who are more willing

TABLE 3
Patient Decision-Making Preferences, Care Plan Documentation, and Care Coordination at Admission (Total n = 17097)

Value	No Documented CD (n = 15321, 89.7%)	Documented CD (n = 1776, 10.3%)	P*
I prefer my doctor give me choices regarding my care** (n, %)			
Definitely agree	11619 (75.8%)	1247 (70.2%)	< 0.0001
Somewhat agree	1912 (12.5%)	252 (14.2%)	
Somewhat disagree	488 (3.2%)	76 (4.3%)	
Definitely disagree	414 (2.7%)	87 (4.9%)	
Don't know	888 (5.8%)	114 (6.4%)	
I prefer to leave care decisions to my physician** (n, %)			
Definitely agree	5660 (36.9%)	613 (34.5%)	< 0.0001
Somewhat agree	4539 (29.6%)	493 (27.8%)	
Somewhat disagree	2265 (14.8%)	257 (14.5%)	
Definitely disagree	1956 (12.8%)	304 (17.1%)	
Don't know	901 (5.9%)	109 (6.1%)	
Documentation of care wishes before hospitalization (n, %)			
No documentation	12238 (79.9%)	527 (29.7%)	< 0.0001
Full support	2624 (17.1%)	742 (41.8%)	
Do not resuscitate or intubate ("DNR/DNI")	264 (1.7%)	370 (20.8%)	
Hospice	53 (0.3%)	22 (1.2%)	
Other limitation (eg, no pressors)	142 (0.9%)	115 (6.5%)	
Had durable power of attorney in chart (n, %)	286 (1.9%)	133 (7.5%)	< 0.0001
Had a living will in chart (n, %)	266 (1.7%)	142 (8.0%)	< 0.0001
Alternate decision maker named in chart (n, %)	2770 (18.1%)	638 (35.9%)	< 0.0001
Patient noted to be unable to participate in their care at admission (eg, confused, unable to respond) (n, %)	1227 (8.0%)	431 (24.3%)	< 0.0001
Inpatient team documented discussion with primary care physician (n, %)	627 (4.1%)	136 (7.7%)	< 0.0001
Do not have a regular medical provider** (n, %)	3836 (25.0%)	254 (14.3%)	< 0.0001
Note from primary care physician in chart (n, %)	148 (1.0%)	39 (2.2%)	< 0.0001

*Calculated using chi-squared tests.

**Collected during intake interview performed within 24 hours of admission.

All other items collected via chart abstraction.

to broach this subject, and either seem more approachable or bring up the topic themselves.

The influence of site on documentation and CD provides additional evidence that caregiver culture played a role in CDs. Although this variation may have been in part due to culture around documentation practices more generally, it is important to note that none of our participating centers had a policy for documentation of care wishes or patient-doctor communication, or a policy mandating these discussions in any specific patient group. Furthermore, site-related differences were seen even in patients with no pre-existing documentation, and were seen after adjustment for other documentation or communication practices (eg, documenting a discussion with the patient's primary care provider), making it unlikely that documentation practices are solely responsible for our results. Persistence of variations in care documentation raises interesting

questions, particularly when one considers recent data describing variations in end-of-life care between similar academic centers (one of which was a participating site in this trial).²³ Given that the sites in our study represent diverse institutions yet share a number of characteristics, understanding the specific practices or aspects of medical culture that promote conversations may provide insights in how to improve this promotion elsewhere.

Our results would argue that mandates to document code status on admission may be unlikely to improve communication unless sites also develop an approach to using this newly documented information as a prompt for subsequent discussions. In nursing home settings, documentation of advance directives may reduce resource use, but it is unclear whether similar effects will be seen in hospital settings.²⁴ It is also a challenge to insure that documentation of a care plan in the

TABLE 4
Factors Associated with Code Status Discussion in Entire Cohort and Patients with No Previous Documentation

	Entire Cohort (n = 17097)		Patients with No Documentation of Preadmission Wishes (n = 12765)	
	Adjusted Odds Ratio (95% CI)	P Value	Adjusted Odds Ratio (95% CI)	P Value
Preadmission Code Status				
No documentation	Referent		NA	
Full support	3.22 (2.28, 4.55)	< 0.0001	NA	
Do not resuscitate or intubate ("DNR/DNI")	11.32 (8.52, 15.04)	< 0.0001	NA	
Hospice	4.02 (2.33, 6.94)	< 0.0001	NA	
Other limitation (eg, no pressors)	10.13 (7.35, 13.96)	< 0.0001	NA	
Insurance type				
Medicare	Referent		Referent	
Charity care	0.50 (0.30, 0.85)	0.0099	0.56 (0.25, 1.25)	0.1589
Commercial	0.81 (0.69, 0.95)	0.0090	0.66 (0.52, 0.85)	0.0009
Medicaid	0.69 (0.57, 0.82)	< 0.0001	0.49 (0.36, 0.67)	< 0.0001
Other	0.46 (0.18, 1.13)	0.0912	0.60 (0.17, 2.12)	0.4302
Self pay	0.70 (0.52, 0.95)	0.0203	0.49 (0.29, 0.81)	0.0060
Any limitations in bathing, toileting, dressing or feeding self?				
No	Referent		Referent	
Yes, a little	1.25 (1.10, 1.42)	0.0007	1.31 (1.03, 1.67)	0.0272
Yes, a lot	1.25 (1.09, 1.43)	0.0015	1.42 (1.11, 1.81)	0.0055
Unable to respond	0.81 (0.59, 1.12)	0.2006	0.80 (0.45, 1.41)	0.4299
Patient has a documented surrogate decision maker	1.72 (1.47, 2.02)	< 0.0001	2.08 (1.62, 2.66)	< 0.0001
Patient noted to be unable to participate in their care at admission (eg, confused, unable to respond)	1.63 (1.37, 1.94)	< 0.0001	2.20 (1.60, 3.02)	< 0.0001
Notation that team had spoken to primary care physician at admission	1.65 (1.29, 2.11)	< 0.0001	1.45 (0.92, 2.28)	0.1116
History of cancer				
No	Referent		Referent	
Yes	1.31 (1.13, 1.51)	0.0003	1.26 (0.96, 1.65)	0.0960
Not sure	1.26 (0.87, 1.82)	0.2162	1.80 (1.03, 3.15)	0.0396
History of diabetes				
No	Referent		Referent	
Yes	0.87 (0.75, 1.003)	0.0543	0.79 (0.62, 0.997)	0.0467
Not sure	0.61 (0.38, 0.99)	0.0445	0.84 (0.43, 1.65)	0.6183
Housing situation				
Own house or apartment	Referent		Referent	
Relative or friend's apartment or house	1.22 (1.03, 1.45)	0.0229	1.29 (0.97, 1.71)	0.0783
Nursing home, group home, or long-term care facility	1.42 (1.16, 1.74)	0.0006	1.74 (1.27, 2.40)	0.0007
Homeless shelter	1.12 (0.72, 1.73)	0.6204	0.87 (0.46, 1.63)	0.6559
Other/Don't know	1.02 (0.75, 1.40)	0.8987	1.35 (0.78, 2.36)	0.2859
Age Group				
<50	Referent		Referent	
50–59	1.19 (0.99, 1.43)	0.0647	1.18 (0.88, 1.59)	0.2583
60–69	1.18 (0.99, 1.40)	0.0585	1.20 (0.88, 1.66)	0.2549
70–79	1.10 (0.91, 1.33)	0.3178	1.19 (0.85, 1.67)	0.3033
80–89	1.23 (1.03, 1.47)	0.0207	1.34 (0.96, 1.88)	0.0879
90+	1.45 (1.12, 1.88)	0.0045	1.44 (0.94, 2.20)	0.0934
Site of Enrollment				
A	Referent		Referent	
B	1.74 (1.16, 2.61)	0.007	4.95 (2.90, 8.45)	< 0.0001
C	5.14 (3.42, 7.74)	< 0.0001	26.36 (17.28, 40.23)	< 0.0001
D	4.19 (2.64, 6.66)	< 0.0001	8.06 (4.63, 14.03)	< 0.0001
E	3.00 (1.82, 4.9)	< 0.0001	5.30 (2.71, 10.38)	< 0.0001
F	4.09 (2.69, 6.23)	< 0.0001	2.32 (1.32, 4.08)	0.0037

nursing home is communicated to the providers in the hospital.²⁵ The PSDA was a first step in this direction, but its effects on improving communication are uncertain.²⁶ Our results would confirm that the PSDA or systems to mandate documentation are not solutions in themselves, but are 2 steps in a larger process.

We do not want to discount our findings of less frequent CDs among patients of lower socioeconomic status, where gaps in quality of care, communication, and outcomes are well-recognized.²⁷ As such, our results delineate yet another area where practice can and should be improved for vulnerable patients. However, factors related to site of care and documentation may provide opportunities to improve care even more profoundly and within a fairly discrete (if complex) acute episode of care. Having said this, our results also demonstrate a potential pitfall of using code status documentation for risk-adjustment, because such notation may be more dependent on local documentation patterns than clinical appropriateness.

Our study has a number of limitations. As an observational study, our findings are likely prone to biases related to unadjusted confounding due to comorbidity. The influence of comorbidity would seem to have been most important in biasing the effects of preexisting documentation, where documentation would be associated with more unaccounted comorbidity. However, there were no differences in documentation even after accounting for prognosis by adjusting for age, functional status, and a valid comorbidity score.²⁸ As we have pointed out, our key outcome is based on documentation of communication and not actual communication, and as such may be biased in subtle ways not related to site of care or the items tested in our model. While we cannot directly eliminate the possibility of documentation biases in our results using statistical methods, it is important to point out that our chart abstraction protocol used highly specific criteria to detect these discussions, and therefore may under-detect discussions which may have been documented in less detail. Our study did not examine whether documentation of CDs influenced subsequent care. However, previous studies have shown that advance care planning has only a minor influence on care.²⁹ However, communication about preferences at the time of admission, when the need for specific care decisions may be more evident, may be more likely to influence hospital care. Our

results show that previous documentation is associated with discussions early in an admission. Such discussion may affect care, even if the decision made is different than what was previously documented. In addition, patients who were included in our study (those able to provide consent and participate in an interview) may be healthier or more cognitively intact than a general population of hospitalized patients. However, how this would have affected our results is unclear. Being able to speak and consent for oneself are key facilitators to communication, but sicker patients who cannot consent or speak for themselves might also be more likely to have care planning decisions made based on illness severity; documentation in these patients may be more driven by whether such notes were required because of the involvement of home health services (or skilled nursing facilities). Finally, although our study is one of the largest examinations of in-hospital communication to date and its implications for resident education are worth noting, the sites involved in the MCHS may not be representative of nonteaching hospitals, or community-based teaching hospitals.

Our results suggest that, although comorbid illness and socioeconomic status play an important role in determining which patients receive CDs at the time of admission, these factors are substantially less powerful than preexisting documentation practices and culture or care practices specific to their site of care. These results suggest that future work should consider organizational characteristics and culture as important targets for interventions to improve care planning in hospitalized patients.

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