

Appendix 1: Online supplemental material

Quality of End-of-Life Communication in Two High-Risk ICU Cohorts: A Retrospective Cohort Study
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Supplementary Table 1: Median regression results for composite end-of-life communication quality for the extracorporeal membrane oxygenation (ECMO) cohort, with additional variables		
<i>Independent variable</i>	<i>Coefficient (95% C.I.)</i>	<i>p-value, not adjusted for multiple comparisons</i>
Age (year)	0.52 (-0.04, 1.07)	0.07
Female sex (vs. male as reference)	1.59 (-16.23, 19.45)	0.86
Year of admission (per year)	1.64 (-1.81, 5.09)	0.35
Glasgow Coma Scale score (per point)	-1.44 (-4.03, 1.14)	0.27
APS-neuro score (per point)	1.04 (-0.68, 2.76)	0.23
Admitting diagnosis category		
Cardiovascular	Reference	
Infectious	2.75 (-22.99, 28.50)	0.83
Respiratory	-7.94 (-36.77, 20.90)	0.59
Other	-5.40 (-41.15, 30.34)	0.77
Socioeconomic status		
1st quintile (lowest income)	Reference	
2nd quintile	0.89 (-23.38, 25.15)	0.94
3rd quintile	16.71 (-16.88, 50.30)	0.33
4th quintile	16.08 (-10.39, 42.54)	0.23
5th quintile (highest income)	-1.91 (-33.06, 29.25)	0.90
Urban residence (vs. rural as reference)	-1.18 (-20.58, 18.22)	0.90
APS-neuro, acute physiological score minus neurological component; C.I., confidence interval		

Supplementary Table 2: Frequency of individual quality indicators for three cohorts			
	Present NH cohort	Present ECMO cohort	p-value†
Goals of care communication (GOCC) items	Yes	Yes	
1. Since hospital admission, member of health care team has talked to patient and/or substitute decision maker about a poor prognosis or indicated in some way that the patient has a limited time left to live.	92 (40.0%)	76 (69.7%)	<0.001
2. Since hospital admission, member of the health care team has talked to patient and/or substitute decision maker about artificial life support.	148 (64.5%)	80 (73.4%)	0.11
3. Since hospital admission, member of health care team has talked to patient and/or substitute decision maker about focusing on comfort care as the goal of the patient's treatment.	94 (40.9%)	51 (46.8%)	0.35

4. Since hospital admission, member of health care team has offered to arrange a time when patient/substitute decision maker/family can meet with the doctor to discuss treatment options and plans	147 (63.9%)	77 (70.6%)	0.27
5. Since hospital admission, member of health care team has asked if the patient or substitute decision maker had prior discussions or has written documents about the use of life-sustaining treatments.	114 (49.6%)	32 (29.4%)	<0.001
6. Since hospital admission, member of health care team has asked patient or substitute decision maker what treatments the patient prefers to have or not have if they develop a life-threatening illness.	135 (58.7%)	53 (48.6%)	0.10
7. Since hospital admission, member of health care team has asked patient/substitute decision maker/family what is important to them as they consider health care decisions at this stage of the patient's life.	72 (31.3%)	42 (38.5%)	0.22
8. Since hospital admission, member of health care team has asked patient/family if they had any questions or needed things clarified regarding the patient's overall goals of care.	105 (45.7%)	44 (40.4%)	0.41
9. Since hospital admission, member of health care team has given patient/substitute decision maker/family opportunity to express patient's fears or discuss what concerns the patient.	29 (12.6%)	24 (22.0%)	0.04
10. Since hospital admission, patient/substitute decision maker has been informed that they may change their minds regarding their decisions around goals of care.	120 (52.2%)	59 (54.1%)	0.82
11. Since hospital admission, patient/substitute decision maker and family have been offered an opportunity to discuss with members of the health care team issues around capacity and consent with regard ACP; specifically, what actions would take place in the possible event of losing capacity to consent to care.	23 (10.0%)	10 (9.2%)	0.99
12. Since hospital admission, patient & family have been offered support from the allied health care team (e.g., spiritual care, social work, and clinical nurse specialist) as needed.	88 (38.3%)	74 (67.9%)	<0.001
13. Since hospital admission, member of health care team provided patient/family information about goals of care discussions to look at before conversations with the doctor.	0	0	1.00
Documentation items	Yes	Yes	
1. Documentation of a goals of care is present in medical record.	205 (89.1%)	95 (87.2%)	0.59
2. Goals of Care present in the medical record is consistent with patient's stated preferences.	206 (89.6%)	94 (86.2%)	0.37
3. If the hospital uses a standardized folder or other strategy to locate ACP/Goals of Care documents in the medical record, these are present in the medical record.	138 (60.0%)	58 (53.2%)	0.24
4. Documentation of ACP conversation is in patient's medical record.	151 (65.7%)	62 (56.9%)	0.15
5. Since admission, a member of the health care team has helped the patient and/or their family access legal documents to communicate the patient's ACPs	99 (43.0%)	5 (4.6%)	<0.001
ACP, Advance Care Planning; NH, nursing home; ECMO, extracorporeal membrane oxygenation; †from Fisher's exact test			

Supplementary Table 3: Sensitivity analysis: median regression results for composite of end-of-life communication with all 18 items weighted equally

<i>Independent variable</i>	<i>Coefficient (95% C.I.)</i>	<i>p-value, not adjusted for multiple comparisons</i>
ECMO cohort (vs. NH cohort reference)	0.18 (-12.12, 12.50)	0.98
Age (per year)	0.51 (0.23, 0.79)	0.001*
Female sex (vs. male as reference)	-3.19 (-13.06, 6.68)	0.53
Year of admission (per year)	1.50 (0.35, 2.65)	0.010*
Glasgow Coma Scale score (per point)	-1.85 (-3.18, -0.52)	0.007*
APS-neuro score (per point)	0.82 (-0.07, 1.70)	0.07
Admitting diagnosis category		
Cardiovascular	Reference	
Infectious	-0.12 (-9.81, 9.57)	0.98
Respiratory	-9.35 (-24.69, 5.99)	0.23
Other	-2.43 (-14.39, 9.52)	0.69

*p-value significant after adjustment for multiple comparisons using the 0.05 false discovery rate threshold; C.I., confidence interval; APS-neuro, acute physiological score with neurological component removed; ECMO, extracorporeal membrane oxygenation; NH, nursing home.

Supplementary Table 4: Sensitivity analysis: median regression results for composite of end-of-life communication, restricted to 2006-2017

<i>Independent variable</i>	<i>Coefficient (95% C.I.)</i>	<i>p-value, not adjusted for multiple comparisons</i>
ECMO cohort (vs. NH cohort reference)	-1.99 (-14.90, 10.92)	0.76
Age (per year)	0.51 (0.20, 0.81)	0.001*
Female sex (vs. male as reference)	-1.96 (-11.57, 7.65)	0.69
Year of admission (per year)	1.62 (0.34, 2.90)	0.014*
Glasgow Coma Scale score (per point)	-1.97 (-3.33, -0.61)	0.005*
APS-neuro score (per point)	0.78 (-0.09, 1.64)	0.08
Admitting diagnosis category		
Cardiovascular	Reference	
Infectious	1.80 (-10.65, 14.26)	0.78
Respiratory	-6.94 (-22.32, 8.43)	0.38
Other	-2.75 (-17.05, 11.55)	0.71

*p-value significant after adjustment for multiple comparisons using the 0.05 false discovery rate threshold; C.I., confidence interval; APS-neuro, acute physiological score with neurological component removed; ECMO, extracorporeal membrane oxygenation; NH, nursing home.