Supplemental Digital Appendix 1

**Survey Instrument, From a Study of Attendings' and Fellows' Perceptions of Futile Treatment in the Intensive Care Unit, University of California, Los Angeles, December 2011–March 2012**

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## Daily Patient Census: PHYSICIAN VERSION

Date: _____                                    Unit: _____

Circle:  Attending / Fellow / NP                            Pager number   _____ _____ _____ _____ _____

| PATIENT *(Only answer for your patients. RA: Strike thru patients that are not under this clinician's care)* | MRN | PATIENT RECEIVING FUTILE TREATMENT? *IF LEFT BLANK, WILL BE PRESUMED "NO"* | | | REASON WHY TREATMENT IS FUTILE: CHECK ALL THAT APPLY | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NO | PROBABLY | YES | 1 Burdens grossly outweigh benefits | 2 Will never survive outside of an ICU | 3 Permanently unconscious | 4 Treatment cannot achieve goal | 5 Death is imminent | 6 Other Reason (please write in) | 7 Receiving futile treatment but in transition to palliative care |
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Supplemental Digital Table 1

**Matched Patient Sample: Reasons Listed for Assessment of Futile Treatment by Attending Critical Care Physicians Versus Critical Care Fellows, From a Study of Attendings' and Fellows' Perceptions of Futile Treatment in the Intensive Care Unit, University of California, Los Angeles, December 2011–March 2012**

| Type or number of reasons | No. (%) patients | |
|---|---|---|
| **Reason listed that treatment was futile** | **By attendings** | **By fellows** |
| | (out of 62) | (out of 62) |
| Burdens grossly outweigh benefits | 36 (58) | 28 (45) |
| Will never survive outside of an ICU | 21 (34)[a] | 10 (16)[a] |
| Permanently unconscious | 25 (40) | 23 (37) |
| Treatment cannot achieve goal | 30 (48)[a] | 18 (29)[a] |
| Death is imminent | 23 (37) | 20 (32) |
| Patient non-adherent to treatment | 0 | 0 |
| Futile treatment on day transitioned to palliative care | 11 (18) | 8 (13) |
| **Number of reasons listed[b]** | **By attending** | **By fellow** |
| 0 | 2 (3) | 3 (5) |
| 1 | 18 (29) | 29 (47) |
| 2 | 19 (31) | 18 (29) |
| 3 | 9 (14) | 7 (11) |
| 4 or more | 14 (23) | 5 (8) |

Abbreviation: ICU indicates intensive care unit.

[a] $P < .05$ for comparison between attendings and fellows.

[b] $P = .015$ for comparison of number of reasons between attendings and fellows by mixed effects Poisson regression.

Supplemental Digital Table 2

**Matched Patient Sample: Attending Model: Average Marginal Difference in Probability of a Patient Being Perceived as Receiving Non-Futile Treatment, Probably Futile Treatment, and Futile Treatment, From a Study of Attendings' and Fellows' Perceptions of Futile Treatment in the Intensive Care Unit, University of California, Los Angeles, December 2011–March 2012[a]**

| Characteristic | Non-futile treatment | Probably futile treatment | Futile treatment |
|---|---|---|---|
| **Patient age (per decade)** | **-2.88 (-4.61, -1.19)** | **1.32 (0.53, 2.15)** | **1.57 (0.60, 2.49)** |
| **Female patient** | **5.00 (0.02, 9.74)** | **-2.21 (-4.23, -0.01)** | **-2.79 (-5.56, 0.06)** |
| Patient race | | | |
|     Asian | -0.19 (-9.07, 8.76) | -0.06 (-4.04, 3.83) | 0.25 (-4.27, 5.54) |
|     African-American | -5.79 (-14.22, 2.21) | 2.30 (-0.93, 5.29) | 3.49 (-1.36, 8.91) |
|     Other | -1.49 (-11.54, 8.97) | 0.50 (-4.26, 4.58) | 0.99 (-4.72, 6.97) |
| Hispanic | 0.75 (-5.86, 7.93) | -0.39 (-3.60, 2.66) | -0.37 (-4.10, 3.42) |
| Insurance | | | |
|     **Medicaid** | **-10.48 (-21.39, -0.71)** | **3.97 (0.63, 7.46)** | **6.51 (-0.19, 13.79)** |
|     Private | -2.16 (-11.51, 6.96) | 0.79 (-3.29, 4.37) | 1.37 (-3.74, 7.00) |
|     HMO | -1.88 (-8.36, 4.11) | 0.82 (-1.97, 3.53) | 1.06 (-2.32, 4.71) |
|     Uninsured | 4.57 (-5.88, 15.01) | -2.39 (-7.81, 2.66) | -2.18 (-7.31, 3.36) |
| Residence > 20 miles (32.3 km) from hospital | -0.74 (-6.24, 4.91) | 0.33 (-2.28, 2.74) | 0.42 (-2.61, 3.59) |
| Source of admission | | | |
|     Outpatient setting | -4.19 (-12.53, 4.27) | 1.68 (-1.55, 5.14) | 2.52 (-2.44, 7.68) |
|     Transferred from outside hospital | 2.20 (-4.71, 8.93) | -1.08 (-4.33, 2.10) | -1.12 (-4.79, 2.49) |
|     **Transferred from SNF/LTAC** | **-29.57 (-44.28, -13.39)** | **6.95 (4.63, 9.38)** | **22.63 (7.57, 36.68)** |
| MS-DRG weight | 0.10 (-0.32, 0.53) | -0.05 (-0.25, 0.14) | -0.06 (-0.28, 0.18) |
| **Hospital day of futility assessment (per day)** | **-0.20 (-0.30, -0.10)** | **0.09 (0.04, 0.14)** | **0.11 (0.05, 0.16)** |
| Physician years at UCLA | 0.01 (-0.57, 0.61) | -0.00 (-0.28, 0.26) | -0.00 (-0.32, 0.31) |

| | | | |
|---|---|---|---|
| Female physician | -3.18 (-12.84, 7.00) | 1.40 (-2.94, 5.61) | 1.78 (-3.85, 7.50) |
| Physician service day | | | |
|     Second | -0.47 (-2.97, 2.02) | 0.20 (-0.89, 1.39) | 0.26 (-1.10, 1.65) |
|     Third | -1.94 (-4.81, 0.82) | 0.85 (-0.35, 2.11) | 1.09 (-0.52, 2.67) |
|     **Fourth** | **-4.16 (-7.49, -1.13)** | **1.78 (0.45, 3.10)** | **2.38 (0.50, 4.30)** |
|     **≥ Fifth** | **-3.76 (-6.23, -1.13)** | **1.71 (0.60, 2.99)** | **2.05 (0.61, 3.45)** |
| ICU | | | |
|     Neuro-ICU | 0.20 (-19.39, 19.76) | -0.27 (-7.76, 6.91) | 0.07 (-12.18, 12.32) |
|     **Cardiac care unit** | **17.13 (10.88, 22.64)** | **-9.44 (-12.60, -5.82)** | **-7.69 (-10.40, -4.91)** |
|     Academic community Hospital mixed-use ICU | 3.82 (-3.71, 10.50) | -1.90 (-5.39, 1.64) | -1.92 (-5.44, 1.84) |
| ICU is full | -1.11 (-2.92, 0.69) | 0.50 (-0.36, 1.28) | 0.61 (-0.40, 1.59) |

Abbreviations: HMO indicates health maintenance organization; SNF, skilled nursing facility; LTAC; long-term acute care facility; ICU, intensive care unit; MS-DRG; Medicare Severity Diagnosis Related Group.

[a] Estimated average difference in percent probability are presented of not receiving futile treatment, receiving probably futile treatment, and receiving futile treatment for attendings using data matched to fellows. A positive percentage is more in a specific category than the reference group, a negative percentage less. Effects that were significant in the model are **bolded** ($P < 0.05$). Parentheses give 95% confidence intervals. Reference for female is male, for race is white, for Hispanic is non-Hispanic, for insurance is Medicare, for source of admission is emergency room, for service day is first, and for ICU is the medical ICU. Total observations = 3,675, total patients = 713, total attendings = 31.

Supplemental Digital Table 3

**Matched Patient Sample: Fellow Model: Average Marginal Difference in Probability of a Patient Being Perceived as Receiving Non-Futile Treatment, Probably Futile Treatment, and Futile Treatment, From a Study of Attendings' and Fellows' Perceptions of Futile Treatment in the Intensive Care Unit, University of California, Los Angeles, December 2011–March 2012[a]**

| Characteristic | Non-futile treatment | Probably futile treatment | Futile treatment |
|---|---|---|---|
| **Patient age (per decade)** | **-2.29 (-4.19, -0.42)** | **0.38 (0.07, 0.71)** | **1.91 (0.35, 3.50)** |
| Female patient | 3.06 (-2.58, 8.64) | -0.50 (-1.37, 0.46) | -2.56 (-7.26, 2.18) |
| Patient race | | | |
|     Asian | 2.58 (-7.50, 12.33) | -0.55 (-2.32, 1.22) | -2.04 (-9.93, 6.34) |
|     African-American | -3.25 (-12.57, 6.17) | 0.38 (-0.94, 1.53) | 2.87 (-5.01, 11.16) |
|     Other | -4.66 (-16.79, 6.76) | 0.51 (-1.02, 1.81) | 4.14 (-5.44, 15.16) |
| Hispanic | 5.96 (-1.81, 13.21) | -1.18 (-2.77, 0.36) | -4.78 (-10.85, 1.02) |
| Insurance | | | |
|     Medicaid | -8.73 (-20.09, 2.37) | 0.91 (-0.22, 1.83) | 7.82 (-2.22, 18.28) |
|     Private | 5.43 (-4.79, 14.68) | -1.10 (-3.05, 0.82) | -4.33 (-12.22, 3.39) |
|     HMO | 0.55 (-6.76, 7.56) | -0.12 (-1.30, 1.06) | -0.44 (-6.14, 5.89) |
|     Uninsured | 8.53 (-3.39, 19.27) | -1.90 (-4.52, 0.78) | -6.63 (-14.58, 2.69) |
| Residence > 20 miles (32.3 km) from hospital | 1.28 (-4.98, 7.98) | -0.20 (-1.20, 0.90) | -1.08 (-6.82, 4.09) |
| Source of admission | | | |
|     Outpatient setting | -4.05 (-12.95, 4.25) | 0.54 (-0.71, 1.62) | 3.51 (-3.79, 11.10) |
|     Transferred from outside hospital | -2.49 (-10.94, 5.95) | 0.33 (-0.94, 1.54) | 2.15 (-4.98, 9.38) |
|     **Transferred from SNF/LTAC** | **-21.27 (-35.77, -7.30)** | **1.36 (0.50, 2.16)** | **19.91 (5.24, 33.69)** |
| **MS-DRG Weight** | **-0.52 (-0.97, -0.05)** | **0.09 (0.01, 0.16)** | **0.44 (0.05, 0.81)** |
| **Hospital day of futility assessment (per day)** | **-0.17 (-0.26, -0.08)** | **0.03 (0.01, 0.05)** | **0.14 (0.07, 0.22)** |
| Physician years at UCLA | -0.08 (-2.86, 2.29) | 0.01 (-0.40, 0.46) | 0.06 (-1.92, 2.37) |

| | | | |
|---|---|---|---|
| Female physician | 6.18 (-8.45, 19.69) | -0.86 (-2.69, 1.20) | -5.33 (-17.27, 7.03) |
| Physician service day | | | |
| **Second** | **-3.63 (-6.49, -0.76)** | **0.53 (0.12, 0.93)** | **3.10 (0.70, 5.66)** |
| **Third** | **-3.57 (-6.80, -0.53)** | **0.52 (0.07, 0.94)** | **3.04 (0.52, 5.97)** |
| **Fourth** | **-7.83 (-11.16, -4.44)** | **1.01 (0.62, 1.43)** | **6.82 (3.78, 9.80)** |
| **≥ Fifth** | **-8.69 (-11.47, -6.06)** | **1.46 (0.91, 1.98)** | **7.22 (5.02, 9.52)** |
| ICU | | | |
| Neuro-ICU | -5.30 (-25.49, 13.18) | 0.81 (-1.85, 3.67) | 4.49 (-11.41, 21.75) |
| **Cardiac care unit** | **23.76 (13.79, 31.82)** | **-6.52 (-8.96, -3.39)** | **-17.24 (-23.39, -10.32)** |
| Academic community Hospital mixed-use ICU | 2.59 (-3.91, 9.13) | -0.50 (-1.70, 0.70) | -2.08 (-7.13, 3.49) |
| ICU is full | 0.96 (-0.90, 2.87) | -0.16 (-0.49, 0.15) | -0.80 (-2.38, 0.76) |

Abbreviations: HMO indicates health maintenance organization; SNF, skilled nursing facility; LTAC, long-term acute care facility; ICU, intensive care unit; MS-DRG, Medicare Severity Diagnosis Related Group.

[a] Estimated average difference in percent probability are presented of not receiving futile treatment, receiving probably futile treatment, and receiving futile treatment. A positive percentage is more in a specific category than the reference group, a negative percentage less. Effects that were significant in the model are **bolded** ($P < .05$). Parentheses give 95% confidence intervals. Reference for female is male, for race is white, for Hispanic is non-Hispanic, for insurance is Medicare, for source of admission is emergency room, for service day is first, and for ICU is the medical ICU. Total observations = 3,675, total patients = 713, total fellows = 14.

Supplemental Digital Table 4

**Attending Model: Sensitivity Analyses From Two Binary Probit Models, Showing the Average Marginal Difference in Probability of a Patient Being Perceived as Receiving Non-futile Treatment and [Probably Futile or Futile Treatment]; and [Non-futile or Probably Futile Treatment] and Futile Treatment, From a Study of Attendings' and Fellows' Perceptions of Futile Treatment in the Intensive Care Unit, University of California, Los Angeles, December 2011–March 2012[a]**

| Characteristic | Non-futile treatment | Probably futile or futile treatment | Non-futile or probably futile treatment | Futile treatment |
|---|---|---|---|---|
| Patient age (per decade) | **-2.57 (-3.86, -1.35)** | **2.57 (1.35, 3.86)** | **-1.54 (-2.67, -0.44)** | **1.54 (0.44, 2.67)** |
| Female patient | 3.55 (0.25, 7.61) | -3.55 (-7.61, -0.25) | **3.28 (0.33, 6.31)** | **-3.28 (-6.31, -0.33)** |
| Patient race (ref. = white) | | | | |
|     Asian | 0.62 (-6.32, 7.34) | -0.62 (-7.34, 6.32) | -2.72 (-9.26, 3.48) | 2.72 (-3.48, 9.26) |
|     African-American | -6.08 (-12.61, 0.19) | 6.08 (-0.19, 12.61) | -4.60 (-11.17, 1.21) | 4.60 (-1.21, 11.17) |
|     Other | 2.13 (-4.77, 9.07) | -2.13 (-9.07, 4.77) | 0.06 (-5.99, 5.91) | -0.06 (-5.91, 5.99) |
| Hispanic | 0.35 (-4.91, 5.40) | -0.35 (-5.40, 4.91) | 1.47 (-2.72, 5.22) | -1.47 (-5.22, 2.72) |
| Insurance (ref. = Medicare) | | | | |
|     Medicaid | -6.43 (-14.41, 1.27) | 6.43 (-1.27, 14.41) | -5.48 (-13.36, 0.78) | 5.48 (-0.78, 13.36) |
|     Private | -4.06 (-10.91, 2.27) | 4.06 (-2.27, 10.91) | -2.12 (-8.47, 3.85) | 2.12 (-3.85, 8.47) |
|     HMO | -1.72 (-6.19, 3.09) | 1.72 (-3.09, 6.19) | -2.75 (-6.58, 1.65) | 2.75 (-1.65, 6.58) |
|     Uninsured | 3.10 (-5.76, 11.31) | -3.10 (-11.31, 5.76) | 4.76 (-0.30, 7.66) | -4.76 (-7.66, 0.30) |
| Residence > 20 miles (32.3 km) from hospital | -2.17 (-6.38, 2.24) | 2.17 (-2.24, 6.38) | 1.46 (-2.37, 4.91) | -1.46 (-4.91, 2.37) |
| Source of admission (ref. = ER) | | | | |
|     Outpatient setting | **5.74 (1.57, 10.21)** | **-5.74 (-10.21, -1.57)** | 3.35 (0.23, 6.62) | -3.35 (-6.62, -0.23) |
|     Transferred from outside hospital | -2.09 (-7.62, 3.53) | 2.09 (-3.53, 7.62) | -1.89 (-7.44, 3.24) | 1.89 (-3.24, 7.44) |
|     Transferred from SNF/LTAC | **-13.57 (-22.29, -4.93)** | **13.57 (4.93, 22.29)** | **-14.81 (-23.91, -5.16)** | **14.81 (5.16, 23.91)** |
| MS-DRG weight | -0.26 (-0.58, 0.02) | 0.26 (-0.02, 0.58) | 0.27 (-0.03, 0.56) | -0.27 (-0.56, 0.03) |

| | | | | |
|---|---|---|---|---|
| Hospital day of futility assessment (per day) | **-0.20 (-0.26, -0.14)** | **0.20 (0.14, 0.26)** | **-0.31 (-0.37, -0.25)** | **0.31 (0.25, 0.37)** |
| Physician years at UCLA | -0.09 (-0.46, 0.27) | 0.09 (-0.27, 0.46) | -0.06 (-0.23, 0.13) | 0.06 (-0.13, 0.23) |
| Female physician | -4.64 (-10.57, 1.74) | 4.64 (-1.74, 10.57) | -0.52 (-2.94, 1.81) | 0.52 (-1.81, 2.94) |
| Physician service day (ref. = first) | | | | |
|     Second | -0.79 (-2.50, 0.80) | 0.79 (-0.80, 2.50) | **1.29 (0.11, 2.26)** | **-1.29 (-2.26, -0.11)** |
|     Third | -0.80 (-2.60, 1.15) | 0.80 (-1.15, 2.60) | 0.82 (-0.35, 1.99) | -0.82 (-1.99, 0.35) |
|     Fourth | **-2.54 (-4.52, -0.36)** | **2.54 (0.36, 4.52)** | 0.69 (-0.58, 1.99) | -0.69 (-1.99, 0.58) |
|     ≥ Fifth | **-2.72 (-4.54, -1.18)** | **2.72 (1.18, 4.54)** | 0.24 (-0.82, 1.51) | -0.24 (-1.51, 0.82) |
| ICU (ref. = MICU) | | | | |
|     Neuro-ICU | 4.24 (-8.83, 16.28) | -4.24 (-16.28, 8.83) | **4.82 (0.26, 8.40)** | **-4.82 (-8.40, -0.26)** |
|     Cardiac care unit | **13.98 (9.35, 17.79)** | **-13.98 (-17.79, -9.35)** | **6.41 (4.23, 8.26)** | **-6.41 (-8.26, -4.23)** |
|     Cardiothoracic ICU | **10.68 (3.46, 17.46)** | **-10.68 (-17.46, -3.46)** | 3.92 (-0.17, 7.49) | -3.92 (-7.49, 0.17) |
|     Academic community hospital mixed-use ICU | -0.51 (-5.34, 4.82) | 0.51 (-4.82, 5.34) | 2.70 (-0.99, 6.52) | -2.70 (-6.52, 0.99) |
| ICU is full | -0.76 (-2.01, 0.51) | 0.76 (-0.51, 2.01) | 0.20 (-0.72, 1.11) | -0.20 (-1.11, 0.72) |

Abbreviations: HMO indicates health maintenance organization; ER, emergency room; SNF, skilled nursing facility; LTAC, long-term acute care facility; ICU, intensive care unit; MS-DRG, Medicare Severity Diagnosis Related Group; MICU, medical intensive care unit.

[a] Estimated average difference in percent probability are presented of receiving non-futile treatment and (probably futile or futile treatment); receiving (no futile or probably futile treatment) and futile treatment. A positive percentage means that this probability is higher than the reference group, a negative percentage lower. Effects that were significant in the model are **bolded** ($P < .05$). Parentheses give 95% confidence intervals. Reference for female is male, for race is white, for Hispanic is non-Hispanic, for insurance is Medicare, for source of admission is emergency room, for service day is first day, and for ICU is the medical ICU. Total observations = 6,897, total patients = 1,125, total physicians = 36.

Supplemental Digital Table 5

**Fellow Model: Sensitivity Analyses From Two Binary Probit Models, Showing the Average Marginal Difference in Probability of a Patient Being Perceived as Receiving Non-futile Treatment and [Probably Futile or Futile Treatment]; and Receiving [Non-futile or Probably Futile Treatment and Futile Treatment, From a Study of Attendings' and Fellows' Perceptions of Futile Treatment in the Intensive Care Unit, University of California, Los Angeles, December 2011–March 2012[a]**

| Characteristic | Non-futile treatment | Probably futile or futile treatment | Non-futile or probably futile treatment | Futile treatment |
|---|---|---|---|---|
| Patient age (per decade) | **-2.09 (-3.88, -0.15)** | **2.09 (0.15, 3.88)** | -0.74 (-2.39, 0.81) | 0.74 (-0.81, 2.39) |
| Female patient | 2.28 (-3.67, 7.69) | -2.28 (-7.69, 3.67) | 0.49 (-4.40, 5.27) | -0.49 (-5.27, 4.40) |
| Patient race (ref. = white) | | | | |
|    Asian | 2.07 (-8.29, 11.29) | -2.07 (-11.29, 8.29) | -0.93 (-10.18, 7.81) | 0.93 (-7.81, 10.18) |
|    African-American | -2.17 (-11.10, 7.67) | 2.17 (-7.67, 11.10) | -6.12 (-14.01, 2.31) | 6.12 (-2.31, 14.01) |
|    Other | -7.41 (-18.26, 4.10) | 7.41 (-4.10, 18.26) | -4.07 (-13.58, 6.98) | 4.07 (-6.98, 13.58) |
|  Hispanic | 7.65 (0.43, 15.53) | -7.65 (-15.53, -0.43) | 4.50 (-1.75, 10.42) | -4.50 (-10.42, 1.75) |
| Insurance (ref. = Medicare) | | | | |
|    Medicaid | -10.48 (-21.34, 0.40) | 10.48 (-0.40, 21.34) | -5.28 (-14.22, 4.57) | 5.28 (-4.57, 14.22) |
|    Private | 2.77 (-6.64, 13.51) | -2.77 (-13.51, 6.64) | 4.65 (-3.14, 12.90) | -4.65 (-12.90, 3.14) |
|    HMO | -0.11 (-7.54, 6.74) | 0.11 (-6.74, 7.54) | 3.17 (-2.70, 9.17) | -3.17 (-9.17, 2.70) |
|    Uninsured | 8.20 (-3.97, 18.50) | -8.20 (-18.50, 3.97) | 8.03 (-1.07, 15.69) | -8.03 (-15.69, 1.07) |
| Residence > 20 miles (32.3 km) from hospital | 2.54 (-3.26, 9.04) | -2.54 (-9.04, 3.26) | 4.86 (-0.70, 10.50) | -4.86 (-10.50, 0.70) |
| Source of Admission (ref. = ER) | | | | |
|    Outpatient setting | -1.98 (-10.58, 6.30) | 1.98 (-6.30, 10.58) | -3.90 (-12.19, 5.30) | 3.90 (-5.30, 12.19) |
|    Transferred from outside hospital | -2.61 (-9.97, 5.23) | 2.61 (-5.23, 9.97) | -3.13 (-10.45, 5.66) | 3.13 (-5.66, 10.45) |
|    Transferred from SNF/LTAC | **-18.85 (-33.08, -5.07)** | **18.85 (5.07, 33.08)** | **-21.28 (-34.43, -6.29)** | **21.28 (6.29, 34.43)** |
| MS-DRG weight | -0.41 (-0.82, 0.08) | 0.41 (-0.08, 0.82) | -0.13 (-0.56, 0.31) | 0.13 (-0.31, 0.56) |

| | | | | |
|---|---|---|---|---|
| Hospital day of futility assessment (per day) | **-0.18 (-0.28, -0.10)** | **0.18 (0.10, 0.28)** | **-0.17 (-0.24, -0.09)** | **0.17 (0.09, 0.24)** |
| Physician years at UCLA | -0.51 (-3.24, 2.12) | 0.51 (-2.12, 3.24) | -3.25 (-10.09, 2.19) | 3.25 (-2.19, 10.09) |
| Female physician | 5.73 (-9.78, 21.53) | -5.73 (-21.53, 9.78) | -5.27 (-28.77, 16.71) | 5.27 (-16.71, 28.77) |
| Physician service day (ref. = first) | | | | |
|     Second | **-3.22 (-5.83, -0.69)** | **3.22 (0.69, 5.83)** | -1.87 (-4.56, 0.34) | 1.87 (-0.34, 4.56) |
|     Third | **-3.15 (-5.76, 0.04)** | **3.15 (-0.04, 5.76)** | **-3.61 (-6.26, -0.98)** | **3.61 (0.98, 6.26)** |
|     Fourth | **-7.14 (-10.30, -3.92)** | **7.14 (3.92, 10.30)** | **-4.94 (-8.01, -2.07)** | **4.94 (2.07, 8.01)** |
|     ≥ Fifth | **-7.91 (-10.18, -5.28)** | **7.91 (5.28, 10.18)** | **-5.94 (-8.43, -3.84)** | **5.94 (3.84, 8.43)** |
| ICU (ref. = MICU) | | | | |
|     Neuro-ICU | -5.32 (-24.05, 15.83) | 5.32 (-15.83, 24.05) | -13.84 (-40.26, 12.97) | 13.84 (-12.97, 40.26) |
|     Cardiac care unit | **23.65 (13.12, 31.11)** | **-23.65 (-31.11, -13.12)** | 10.27 (-10.93, 24.08) | -10.27 (-24.08, 10.93) |
|     Academic community hospital mixed-use ICU | -0.94 (-7.51, 6.14) | 0.94 (-6.14, 7.51) | 2.25 (-3.51, 8.07) | -2.25 (-8.07, 3.51) |
| ICU is full | 0.30 (-1.48, 2.00) | -0.30 (-2.00, 1.48) | 0.56 (-1.09, 2.06) | -0.56 (-2.06, 1.09) |

Abbreviations: HMO indicates health maintenance organization; ER, emergency room; SNF, skilled nursing facility; LTAC, long-term acute care facility; ICU, intensive care unit; MS-DRG, Medicare Severity Diagnosis Related Group; MICU, medical intensive care unit.

[a] Estimated average difference in percent probability are presented of not receiving futile treatment and receiving (probably futile or futile treatment); and receiving (non-futile or probably futile treatment), and futile treatment. A positive percentage means that this probability is higher than the reference group, a negative percentage lower. Effects that were significant in the model are **bolded** ($P <$ .05). Parentheses give 95% confidence intervals. Reference for female is male, for race is white, for Hispanic is non-Hispanic, for insurance is Medicare, for source of admission is emergency room, for service day is first, and for ICU is the medical ICU. Total observations = 4,410, total patients = 773, total fellows = 14.