

Supplementary Online Content

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eFigure. Proportion of Patients Discharged Directly Home from ICU by Hospital

eTable 1. Most Frequent ICU Admission Diagnoses for Patients Discharged Directly Home from ICU

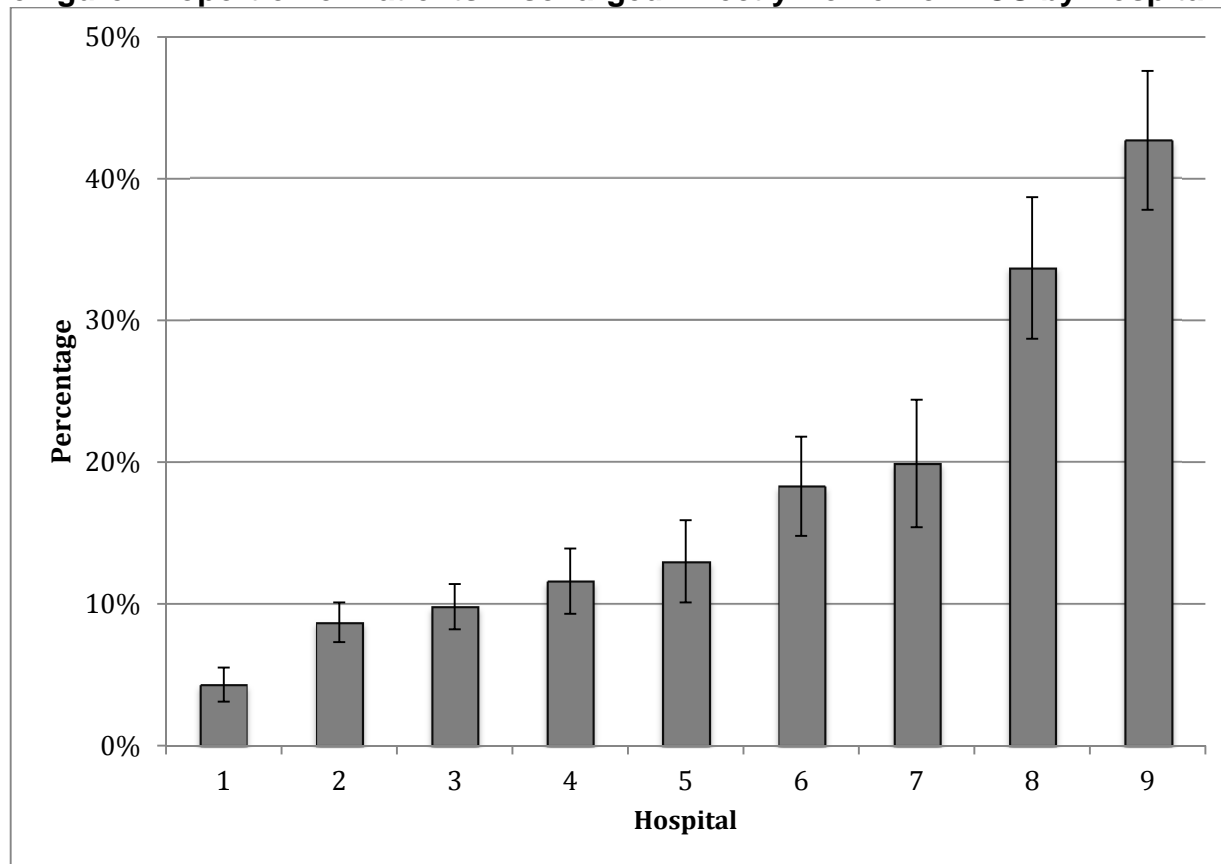
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This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure. Proportion of Patients Discharged Directly Home from ICU by Hospital^a



^aError bars represent 95% confidence intervals

eTable 1. Most Frequent ICU Admission Diagnoses for Patients Discharged Directly Home from ICU.

Admission Diagnosis^a	Number (percent) N=911^b
Overdose	208 (23)
Pneumonia	104 (11)
Trauma or orthopedic injury	79 (9)
Other respiratory problems	55 (6)
Sepsis (non-pulmonary)	52 (6)
Other Medical or neurological problems	48 (5)
Gastrointestinal problems	45 (5)
Airway obstruction	40 (4)
Seizures	39 (4)
Obstructive lung disease	38 (4)
Metabolic coma	35 (4)
Cardiovascular problems	25 (3)
Neuromuscular respiratory failure	24 (3)
Cardiac arrest	15 (2)
Complications of diabetes	15 (2)
Venous thromboembolism	15 (2)
Withdrawal from substance dependence	13 (1)
Anaphylaxis	12 (1)
Congestive heart failure	12 (1)
Renal failure	12 (1)
Complications of pregnancy or genitourinary surgery	9 (1)
Cancer	8 (1)
Encephalopathy	8 (1)

^a Diagnoses represent collations of APACHE IV ICU diagnoses on admission to ICU. The 24 admission diagnoses were aggregated into ten reasons for ICU admission for parsimonious presentation in Table 1.

^b Admission diagnosis missing for 11 patients

eTable 2. Multivariable Logistic Regression Analysis of Patient and Hospital Characteristics Associated with Patients Discharged Directly Home^a

Characteristics	Odds Ratio ^b (95% CI)	P-Value
Age	0.98 (0.98-0.99)	<0.001
Charlson score	0.88 (0.84-0.93)	<0.001
ICU admission diagnosis		
Overdose/withdrawal/seizures/metabolic coma	1.94 (1.48-2.54)	<0.001
Location before ICU admission		
Emergency department	1.00 (reference group)	-
Operating room/recovery	0.32 (0.25-0.43)	<0.001
Ward	0.60 (0.46-0.78)	<0.001
Other hospital	1.17 (0.85-1.61)	0.32
Admission APACHE II score	0.974 (0.949-0.995)	0.02
Admission SOFA score	0.93 (0.89-0.96)	<0.001
Previous ICU admission during hospital admission	0.51 (0.29-0.90)	0.02
Invasive mechanical ventilation		
None	1.00 (reference group)	-
Duration < 48 hours	1.21 (1.02-1.44)	0.03
Duration ≥ 48 hours	0.72 (0.58-0.89)	0.003
Vasoactive medications received	0.84 (0.70-1.02)	0.08
Discharge SOFA score	0.93 (0.89-0.98)	0.005
ICU Occupancy ≥ 80%	0.39 (0.33-0.45)	<0.001
>24 hours in ICU after ready for ICU discharge ^c	1.31 (1.06-1.62)	0.01

^a Variables with $p < 0.2$ from univariate analyses in Table 1 were considered in model construction: age, Charlson score, ICU admission diagnosis, location before ICU admission, admission APACHE II score, admission SOFA score, previous ICU admission during hospital admission, invasive mechanical ventilation (none, duration < 48 hours, duration ≥ 48 hours), vasoactive medications received (y/n), renal replacement therapy (y/n), discharge SOFA score, teaching hospital, ≥600 hospital beds, ≥ 20 ICU beds, ≥1 ICU discharge directly home per week, ICU occupancy ≥ 80%, > 24 hours in ICU after ready for ICU discharge, ICU length of stay). Hospital length of stay and public community supports on hospital discharge were not considered in model construction as they maybe influenced by care provided after patient discharge from ICU.

^b Reference group are patients discharged home via a hospital ward.

^c Defined as time from when patient determined to be ready for ICU discharge to when patient left the ICU.

eTable 3. Cox Proportional-Hazard Analysis of Healthcare Utilization after Hospital Discharge in the Matched Cohort Among Subgroups of Patients with the Most Common ICU Admission Diagnoses^a

Measures ^b	Hazard Ratio (95% CI) ^c		
	Overdose, withdrawal, seizures or metabolic coma (n=480)	Pneumonia (n=197)	Respiratory other (n=228)
Hospital readmission			
30 days	1.19 (0.86-1.65)	0.76 (0.33-1.75)	0.84 (0.27-2.62)
90 days	0.94 (0.72-1.24)	0.75 (0.38-1.48)	0.70 (0.31-1.55)
365 days	0.94 (0.73-1.21)	0.80 (0.46-1.37)	0.76 (0.44-1.30)
Emergency department visit			
30 days	1.14 (0.94-1.39)	1.14 (0.66-1.95)	1.03 (0.55-1.94)
90 days	1.09 (0.95-1.26)	1.07 (0.80-1.44)	0.86 (0.52-1.41)
365 days	0.97 (0.85-1.11)	1.08 (0.76-1.52)	0.92 (0.62-1.37)

^a Analyses restricted to the three most common diagnostic groups for patients discharged directly home.

^b Modeling not done for mortality due to small number of deaths in subgroups.

^c Reference group are patients discharged home via the hospital ward.

eTable 4. Univariable Cox Proportional-Hazard Analysis of Risk Factors for Joint Outcome of Hospital Readmission or Emergency Department Visit within 30 days of Patient Discharge Directly Home from ICU^{a,b}

Characteristic	Hospital Readmission or Emergency Department Visit			
	Yes (n=227)	No (n=695)	Hazard Ratio (95% CI)	P-Value
Patient Characteristics on Admission to ICU				
Female	94 (41)	299 (43)	0.93 (0.79-1.09)	0.36
Age, median (IQR)	44 (31-57)	48 (32-60)	0.99 (0.99-1.00)	0.02
Charlson score	0 (0-1)	0 (0-1)	0.93 (0.86-1.01)	0.07
Admission diagnosis^c				
Overdose/withdrawal/seizures/metabolic coma	87 (38)	208 (30)	1.36 (1.10-1.69)	0.005
Pneumonia	26 (12)	78 (11)	1.01 (0.82-1.24)	0.95
Respiratory other	27 (12)	106 (16)	0.75 (0.49-1.14)	0.17
Medical or neurological other	22 (10)	85 (12)	0.80 (0.57-1.12)	0.19
Trauma/Orthopedic	21 (9)	58 (9)	1.14 (0.79-1.65)	0.49
Cardiovascular	17 (8)	50 (7)	1.03 (0.68-1.54)	0.90
Sepsis (non-pulmonary)	13 (6)	39 (6)	1.00 (0.58-1.74)	1.00
Gastrointestinal	7 (3)	38 (6)	0.58 (0.32-1.07)	0.08
Pregnancy or Genitourinary	5 (2)	16 (2)	0.97 (0.47-2.00)	0.94
Malignancy	1 (0)	7 (1)	0.46 (0.10-2.09)	0.32
Location before ICU admission^d				
Emergency department	150 (66)	457 (66)	1.00	-
Operating room/recovery	18 (8)	80 (12)	0.72 (0.57-0.91)	0.006
Ward	40 (18)	120 (17)	1.02 (0.84-1.23)	0.14
Other hospital	18 (8)	37 (5)	1.48 (0.88-2.51)	0.86
APACHE II score, median (IQR)	15 (10-21)	15 (9-20)	1.01 (0.99-1.02)	0.35
SOFA score, median (IQR)	5 (3-8)	5 (3-7)	1.05 (1.01-1.08)	0.01
Interventions Received in ICU				
Non-invasive mechanical ventilation	18 (8)	95 (14)	0.58 (0.29-1.16)	0.13
Invasive mechanical ventilation				
None	90 (40)	318 (46)	1.00	-
Duration < 48 hrs	97 (43)	292 (42)	1.15 (0.98-1.35)	0.09
Duration ≥ 48 hrs	40 (18)	85 (12)	1.53 (1.18-1.98)	0.001
Vasoactive medications	48 (21)	128 (18)	1.14 (0.88-1.49)	0.33
Renal replacement therapy	3 (1)	6 (1)	1.33 (0.43-4.11)	0.62
Patient Characteristics on Discharge from ICU				
SOFA score, median (IQR) ^e	2 (2-5)	2 (2-5)	0.99 (0.91-1.07)	0.73
Hospital Characteristics				
Teaching hospital	170 (75)	522 (75)	0.98 (0.85-1.14)	0.82
≥ 600 Hospital beds	109 (48)	289 (42)	1.26 (1.09-1.45)	0.002
≥ 20 ICU beds	91 (40)	235 (34)	1.26 (1.10-1.45)	<0.001
> 1 ICU direct home discharges per week	146 (64)	418 (60)	1.17 (0.99-1.39)	0.06
ICU occupancy ≥ 80% ^f	143 (63)	416 (60)	1.13 (0.93-1.37)	0.23
> 24 hours in ICU after ready for ICU discharge ^g	83 (37)	270 (39)	0.90 (0.74-1.10)	0.30
ICU length of stay (days), median (IQR)	2.8 (1.5-5.2)	3.0 (1.7-5.7)	1.00 (0.98-1.02)	0.75
Public community supports on hospital discharge^h				
Without community support services	186 (82)	619 (89)	1.00	-
With community support services	18 (8)	41 (6)	1.41 (0.90-2.20)	0.14
Left against medical advice	23 (10)	35 (5)	1.97 (1.22-3.19)	0.006

^a Analyses limited to only those patients discharged directly home ICU

^b Data presented as number (percent) unless otherwise indicated.

^c Data missing for 11 patients

^d Data missing for 2 patients

^e SOFA score calculated using data from the patient's last day in ICU

^f Percent of ICU beds occupied by patients at time of patient discharge from ICU

^g Defined as the number of hours from when a service accepted the patient in transfer from the ICU to when the patient left the ICU. Data was missing for 333 patients and assumed to represent no delay.

^h Defined as personal or health care services for patients living in a private residential setting that are covered by the health insurance system (e.g., home care nurse visits)