

**Echocardiogram in the Evaluation of Hemodynamically Stable Acute Pulmonary Embolism:
National Practices and Clinical Outcomes**

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Online Data Supplement

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Table E1: ICD-9-CM Coding key

Condition	ICD-9-CM Codes
Inclusion Criteria:	Present on admission (POA)
Acute Pulmonary Embolism	415.1, 415.11, 415.13, 415.19, 673.2x
Exclusion Criteria:	Present on admission (POA)
Shock	785.5, 785.50, 785.51, 785.52, 785.59
Hypotension	458.0, 458.8, 458.9, 796.3
Acute Blood Loss Anemia	285.1
Hemorrhagic Stroke	430, 431, 432.00, 432.1, 432.9
Gastrointestinal Bleed	530.82, 531.0, 531.1, 531.2, 532.0, 532.1, 532.2, 533.0, 533.1, 533.2, 534.0, 534.1, 534.2, 535, 537, 562.02, 562.12, 569.3, 569.85, 578.0, 578.1, 578.9
Acute Organ Failures	
Hematological Failure	287.3, 287.4, 287.5, 286.9, 286.6, 286.2
Hepatic Failure	570, 572.2, 573.3
Metabolic Failure	276.2
Neurological Failure	348.3, 293, 348.1, 780.01, 780.09, 891.4
Renal Failure	584
Respiratory Failure	518.81, 518.82, 518.84, 786.09, 799.1
Electrolyte Abnormality	276x, 275.2
Myocardial Infarction	412
Comorbidities:	
Congestive heart failure	425, 428.32, 428.22, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 402.01, 402.11, 402.91, 398.91
Atrial Fibrillation	427.3

COPD	491, 492
Chronic Hypertension	401, 402, 403, 404, 405
Diabetes	250
Obesity	278
Coronary artery disease	412
Ischemic Stroke	433, 434, 436
Solid Tumor	14, 15, 16, 170, 171, 172, 174, 175, 179, 18, 190, 191
Lymphoma	200, 201, 202.0, 202.1, 202.2, 202.3, 202.5, 203, 238.6, 273.3
Metastatic Cancer	196, 197, 198, 199.0, 199.1, 209.7, 789.51
Peripheral Vascular Disease	440.2, 440.3, 443.9
Rheumatological Disease	710.0, 710.1, 710.4, 714.0, 714.1, 714.2, 714.8
Dementia	280
Hemiplegia	342
Paralysis	344.0, 344.1, 344.2, 344.3, 344.4, 344.5, 344.8, 344.9

POA present on admission, *COPD* chronic obstructive pulmonary disease

Table E2: Procedure billing code key for Premier inpatient database

Charge Description
<i>Echocardiogram Use</i>
ECHO COLOR FLOW VELOCITY MAPPING
ECHO DOPPLER LIMITED
PF ECHO DOPPLER
ECHO 2D W/M-MODE & COLOR FLOW
PF ECHO COLOR FLOW VELOCITY MAPPING
ECHO 2D W/ OR W/O M-MODE PORTABLE
PF ECHO DOPPLER LIMITED
ECHO 2D W/ OR W/O M-MODE LIMITED
PF ECHO 2D W/ OR W/O M-MODE LIMITED
ECHO DOPPLER
PF ECHO 2D W/ OR W/O M-MODE COMPLETE W/ COLOR FLOW
PF ECHO 2D W/ OR W/O M-MODE COMPLET W/O COLOR FLOW
ECHO DOPPLER & COLOR FLOW
ECHO STAT FEE
ECHO CONGENITAL ANOMALY LIMITED
ECHO 2D W/M-MODE & DOPPLER
PF ECHO DOPPLER PORTABLE
ECHO 2D W/M-MODE PED
ECHO DOPPLER PORTABLE
ECHO PORTABLE FEE
PF ECHO CONGENITAL ANOMALY LIMITED
ECHO 2D W/ OR W/O M-MODE COMPLETE W/O COLOR FLOW

ECHO CONGENITAL ANOMALY COMPLETE
ECHO 2D W/ OR W/O M-MODE COMPLETE W/ COLOR FLOW
PF ECHO CONGENITAL ANOMALY COMPLETE
<i>Cardiac Troponin Lab</i>
PF TROPONIN QN
TROPONIN QUAL
TROPONIN QN
PF TROPONIN QUAL
PF TROPONIN QN
<i>Beta-natriuretic peptide (BNP) Lab</i>
B-TYPE NATRIURETIC PEPTIDE
PF B-TYPE NATRIURETIC PEPTIDE
<i>Intensive Care Unit (ICU) Admission</i>
PF CRITICAL CARE ADDL 30 MIN
PF CRITICAL CARE 1ST HR
OBSERVATION ICU/CCU ADDL HR
R&B MICU
OBSERVATION ICU/CCU FLAT RATE
R&B ICU
R&B MICU ISOLATION
OBSERVATION ICU 7-11 HRS
OBSERVATION ICU/CCU PER HR
OBSERVATION ICU 12-18 HRS
PATIENT CARE ICU W/MECHANICAL VENT 24 HRS OR LESS
OBSERVATION ICU PARTIAL DAY

OBSERVATION ICU FLAT RATE
R&B CICU/CCU ISOLATION (CORONARY CARE)
R&B CICU/CCU (CORONARY CARE)
R&B ICU ISOLATION
R&B CVICU
OBSERVATION ICU 0-6 HRS
R&B SICU
R&B SICU ISOLATION
OBSERVATION ICU PER HR
OBSERVATION ICU PARTIAL STAY PER HR
OBSERVATION ICU/CCU ADDL 30 MIN
OBSERVATION ICU/CCU PER 30 MIN
R&B CVICU ISOLATION
<i>Step-down Admission</i>
R&B STEP DOWN CICU/CCU DELUXE
R&B STEP DOWN CVICU ISOLATION
R&B STEP DOWN CICU/CCU SEMI PRIVATE
R&B STEP DOWN SICU PRIVATE
R&B STEP DOWN CVICU SEMI PRIVATE
R&B STEP DOWN CVICU PRIVATE
R&B STEP DOWN MICU ISOLATION
R&B STEP DOWN MICU DELUXE
R&B STEP DOWN SICU DELUXE
R&B STEP DOWN CICU/CCU PRIVATE
R&B STEP DOWN SEMI PRIVATE
R&B STEP DOWN MICU SEMI PRIVATE
R&B STEP DOWN CICU/CCU ISOLATION
R&B STEP DOWN SICU ISOLATION

R&B STEP DOWN CVICU DELUXE
R&B STEP DOWN SICU SEMI PRIVATE
R&B STEP DOWN MICU PRIVATE

Table E3: Vasopressor pharmacy billing charge key for Premier inpatient database

List of Vasopressors/Inotropes *
DOBUTAMINE MISC
DOBUTAMINE, DOBUTREX IVPB 1GM
DOBUTAMINE, DOBUTREX IVPB 250MG
DOBUTAMINE, DOBUTREX IVPB 500MG
DOBUTAMINE, DOBUTREX VL 250MG
DOPAMINE IVPB 1600MG 500ML
DOPAMINE IVPB 200MG 250ML
DOPAMINE IVPB 400MG 250ML
DOPAMINE IVPB 400MG 500ML
DOPAMINE IVPB 800MG 250ML
DOPAMINE IVPB 800MG 500ML
DOPAMINE MISC
DOPAMINE, INTROPIN INJ 160MG/ML 5ML
DOPAMINE, INTROPIN INJ 40MG
DOPAMINE, INTROPIN INJ 40MG/ML 10ML
DOPAMINE, INTROPIN INJ 40MG/ML 20ML
DOPAMINE, INTROPIN INJ 40MG/ML 5ML
DOPAMINE, INTROPIN INJ 80MG/ML 10ML
DOPAMINE, INTROPIN VL 160MG/ML 5ML
DOPAMINE, INTROPIN VL 40MG/ML 10ML
DOPAMINE, INTROPIN VL 40MG/ML 5ML
DOPAMINE, INTROPIN VL 80MG/ML 20ML
DOPAMINE, INTROPIN VL 80MG/ML 5ML
MILRINONE LAC MISC
MILRINONE LAC, PRIMACOR INJ 1MG/ML 5ML
MILRINONE LAC, PRIMACOR IVPB 0.2MG/ML 100ML
MILRINONE LAC, PRIMACOR IVPB 1MG/ML 100ML
MILRINONE LAC, PRIMACOR VL 1MG/ML 10ML
MILRINONE LAC, PRIMACOR VL 1MG/ML 20ML
NOREPINEPHRINE MISC

NOREPINEPHRINE, LEVOPHED AMP 1MG/ML 2ML
NOREPINEPHRINE, LEVOPHED AMP 1MG/ML 4ML
PHENYLEPH MISC
PHENYLEPH, NEO-SYNEPH AMP 1% 10MG/ML 1ML
PHENYLEPH, NEO-SYNEPH AMP 1% 10MG/ML 5ML
VASOPRESSIN MISC
VASOPRESSIN, PITRESSIN AMP 20U/ML 0.5ML
VASOPRESSIN, PITRESSIN AMP 20U/ML 1ML
VASOPRESSIN, PITRESSIN AMP 20U/ML 5ML
VASOPRESSIN, PITRESSIN TAN/OIL AMP 5U/ML 1ML

* We examined the correlation between use of a vasopressor on day 0-1 and ICD-9 codes for hypotension/shock present on admission (POA). Among excluded patients who received a vasopressor on admission (day 0-1), 55% had ICD-9 codes identifying hypotension or shock POA. Conversely, among excluded patients who had ICD-9 codes identifying hypotension or shock POA, 6% received a vasopressor on admission.

Table E4: Thrombolytic pharmacy billing charge key for Premier inpatient database

Thrombolytic Pharmacy Charge Description
<i>Systemic Thrombolytics</i>
ALTEPLASE MISC
ALTEPLASE, ACTIVASE VL 100MG
ALTEPLASE, ACTIVASE VL 20MG
ALTEPLASE, ACTIVASE VL 50MG
ANISTREPLASE MISC
ANISTREPLASE, EMINASE VL 30U
RETEPLASE MISC
RETEPLASE, RETAVASE 1 VIAL 10.8IU(18.8MG) 1/2 KIT
RETEPLASE, RETAVASE 2 VIAL 10.8IU(18.8MG) KIT
STREPTOKINASE MISC
STREPTOKINASE, KABIKINASE VL 600,000IU
STREPTOKINASE, STREPTASE VL 1,500,000IU
STREPTOKINASE, STREPTASE VL 250,000IU
STREPTOKINASE, STREPTASE VL 750,000IU
TENECTEPLASE MISC
TENECTEPLASE, TNKASE VL 50MG
UROKINASE MISC
UROKINASE, ABBOKINASE VL 250,000U
UROKINASE, ABBOKINASE VL 9,000U
<i>Line/Chest Tube clearance *</i>
ALTEPLASE, ACTIVASE VL 1MG
UROKINASE, ABBOKINASE VL 2,500U
UROKINASE, ABBOKINASE VL 5,000U

* Pharmacy charges that were consistent with catheter clearance (i.e., 1mg alteplase) were not coded as systemic thrombolytic. For thrombolytic pharmacy charges lacking detail which would allow differentiation of systemic vs. local use (e.g., alteplase misc), the thrombolytic was classified as systemic

Table E5: ICD-9-CM Coding Key for Bleeding Complications

ICD-9 Coding Schema for Identifying Bleeding	
Originally Validated ICD-9-CM Codes (Arnason <i>et al</i> [23])	
Code	Description
423.00	Hemopericardium
430.00	Subarachnoid hemorrhage
431.00	Intracerebral hemorrhage
432.00	Nontraumatic extradural hemorrhage
432.1	Subdural hemorrhage
432.9	Unspecified intracranial hemorrhage
455.20	Internal hemorrhoids with other complication
455.50	External hemorrhoids with other complication
455.80	Unspecified hemorrhoids with other complication
459.00	Hemorrhage, unspecified
456.00	Esophageal varices with bleeding
456.20	Esophageal varices in diseases classified elsewhere
530.70	Gastroesophageal laceration-hemorrhage syndrome
530.80	Other specified disorders of esophagus
531.00	Acute gastric ulcer with hemorrhage
531.01	Acute gastric ulcer with hemorrhage, with obstruction
531.20	Acute gastric ulcer with hemorrhage and perforation, without mention of obstruction
531.21	Acute gastric ulcer with hemorrhage and perforation, with obstruction
531.40	Chronic or unspecified gastric ulcer with hemorrhage, without mention of obstruction
531.41	Chronic or unspecified gastric ulcer with hemorrhage, with obstruction
531.60	Chronic or unspecified gastric ulcer with hemorrhage and perforation, without mention of obstruction
531.61	Chronic or unspecified gastric ulcer with hemorrhage and perforation, with obstruction
532.00	Acute duodenal ulcer with hemorrhage
532.01	Acute duodenal ulcer with hemorrhage, with obstruction
532.20	Acute duodenal ulcer with hemorrhage and perforation, without mention of obstruction

532.21	Acute duodenal ulcer with hemorrhage and perforation, with obstruction
532.40	Chronic or unspecified duodenal ulcer with hemorrhage, without mention of obstruction
532.41	Chronic or unspecified duodenal ulcer with hemorrhage, with obstruction
532.60	Chronic or unspecified duodenal ulcer with hemorrhage and perforation, without mention of obstruction
532.61	Chronic or unspecified duodenal ulcer with hemorrhage and perforation, with obstruction
533.00	Acute peptic ulcer of unspecified site with hemorrhage
533.01	Acute peptic ulcer of unspecified site with hemorrhage, with obstruction
533.20	Acute peptic ulcer of unspecified site with hemorrhage and perforation
533.21	Acute peptic ulcer of unspecified site with hemorrhage and perforation, with obstruction
533.40	Chronic or unspecified peptic ulcer of unspecified site with hemorrhage
533.41	Chronic or unspecified peptic ulcer of unspecified site with hemorrhage, with obstruction
533.60	Chronic or unspecified peptic ulcer of unspecified site with hemorrhage and perforation
533.61	Chronic or unspecified peptic ulcer of unspecified site with hemorrhage and perforation, with obstruction
534.00	Acute gastrojejunal ulcer with hemorrhage
534.01	Acute gastrojejunal ulcer, with hemorrhage, with obstruction
534.20	Acute gastrojejunal ulcer with hemorrhage and perforation
534.21	Acute gastrojejunal ulcer with hemorrhage and perforation, with obstruction
534.40	Chronic or unspecified gastrojejunal ulcer with hemorrhage
534.41	Chronic or unspecified gastrojejunal ulcer, with hemorrhage, with obstruction
534.60	Chronic or unspecified gastrojejunal ulcer with hemorrhage and perforation
534.61	Chronic or unspecified gastrojejunal ulcer with hemorrhage and perforation, with obstruction
535.01	Acute gastritis, with hemorrhage
535.11	Atrophic gastritis, with hemorrhage
535.21	Gastric mucosal hypertrophy, with hemorrhage
535.31	Alcoholic gastritis, with hemorrhage
535.41	Other specified gastritis, with hemorrhage
535.51	Unspecified gastritis and gastroduodenitis, with hemorrhage
535.61	Duodenitis, with hemorrhage
537.80	Other specified disorders of stomach and duodenum
562.02	Diverticulosis of small intestine with hemorrhage

562.03	Diverticulitis of small intestine with hemorrhage
562.12	Diverticulosis of colon with hemorrhage
562.13	Diverticulitis of colon with hemorrhage
568.81	Hemoperitoneum (nontraumatic)
569.30	Hemorrhage of rectum and anus
569.85	Angiodysplasia of intestine with hemorrhage
578.00	Hematemesis
578.10	Blood in stool
578.90	Hemorrhage of gastrointestinal tract, unspecified
593.81	Vascular disorders of kidney
599.70	Hematuria
623.80	Other specified noninflammatory disorders of vagina
626.20	Excessive or frequent menstruation
626.60	Metrorrhagia
719.10	Hemarthrosis, unspecified
719.11	Hemarthrosis, shoulder
719.12	Hemarthrosis, upper arm
719.13	Hemarthrosis, forearm
719.14	Hemarthrosis, hand
719.15	Hemarthrosis, pelvic region and thigh
719.16	Hemarthrosis, lower leg
719.17	Hemarthrosis, ankle and foot
719.18	Hemarthrosis, other specified sites
784.70	Epistaxis
784.80	Hemorrhage from throat
786.30	Hemoptysis
Additional ICD-9-CM Codes	
997.02	Iatrogenic cerebrovascular infarction or hemorrhage
285.1	Acute posthemorrhagic anemia
530.82	Esophageal hemorrhage

Table E6. Multivariate-adjusted factors associated with use of trans-thoracic echocardiogram in patients with hemodynamically stable, acute pulmonary embolism (N=64,037)

Characteristic	Odds Ratio	95 % CI		p-value *
Demographics				
Age (per 10-year increase)	1.04	1.02	1.05	< 0.01
Race/ethnicity				
White	REF			
Black	1.02	0.96	1.07	
Hispanic	0.86	0.77	0.96	0.03
Other	1.03	0.96	1.10	
Female sex	0.90	0.87	0.94	< 0.01
Primary insurance payer				
Medicare	REF			
Medicaid	0.94	0.87	1.01	
Other	1.05	0.95	1.15	< 0.01
Private insurance	1.16	1.10	1.21	
Self-Pay	1.03	0.94	1.13	
Hospital characteristics				
# beds (per 100-bed increase)	1.04	1.00	1.07	0.04
Location				
Rural	REF			
Urban	1.15	0.96	1.39	0.14
Teaching hospital	0.88	0.74	1.05	0.16
Geographic area				
South	REF			
Midwest	1.30	1.08	1.55	
Northeast	1.98	1.61	2.44	< 0.01
West	1.21	1.00	1.47	
Comorbidities †				
Congestive heart failure	1.53	1.41	1.65	< 0.01
Atrial fibrillation	1.40	1.32	1.48	< 0.01
COPD	0.95	0.88	1.02	0.15
Chronic hypertension	1.11	1.07	1.15	< 0.01

Diabetes	1.07	1.02	1.12	< 0.01
Obesity	1.49	1.42	1.56	< 0.01
Coronary artery disease	0.88	0.66	1.18	0.40
Ischemic stroke	1.25	1.03	1.52	0.02
Solid tumor	0.75	0.70	0.80	< 0.01
Lymphoma	0.92	0.75	1.12	0.39
Metastatic cancer	0.78	0.72	0.84	< 0.01
Peripheral vascular disease	1.01	0.91	1.11	0.91
Rheumatologic disease	1.02	0.92	1.13	0.67
Dementia	1.09	1.00	1.18	0.05
Hemiplegia	1.02	0.70	1.49	0.90
Paralysis	0.84	0.65	1.10	0.20
Acute organ failures †				
Respiratory failure	1.56	1.46	1.67	< 0.01
Renal failure	1.49	1.38	1.61	< 0.01
Neurological failure	1.06	0.90	1.26	0.47
Hematological failure	1.23	1.13	1.34	< 0.01
Hepatic failure	1.73	1.18	2.54	0.01
Metabolic failure	1.27	1.06	1.51	0.01
Electrolyte abnormalities	1.10	1.04	1.15	< 0.01
Acute myocardial infarction	2.06	1.74	2.45	< 0.01
Attending physician specialty				
Internal medicine	REF			
Cardiology	1.59	1.44	1.75	
Medical oncology	0.61	0.55	0.68	
Other	0.96	0.92	1.01	<0.01
Pulmonary-Critical Care	1.11	1.02	1.20	
Surgery	0.71	0.60	0.83	
Year of hospitalization				
2008	REF			
2009	0.93	0.88	0.97	0.02
2010	0.96	0.91	1.00	
2011	0.96	0.91	1.01	

COPD chronic obstructive pulmonary disease. ^a From hierarchical regression models accounting for demographics, comorbidities, acute organ failures, and hospital characteristics. † Present on hospital admission

Sensitivity Analyses:

Table E7. Outcomes associated with trans-thoracic echocardiogram use: hospital-level exposure and patient-level ICU or step-down admission (N=64,037)

Outcome	Hospital echocardiogram rate for pulmonary embolism				p-value*
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
	0-33%	33-42%	42-52%	52-89%	
ICU admission (OR, 95% CI)	Ref	0.86 (0.66-1.11)	1.19 (0.91-1.55)	1.57 (1.18-2.07)	< 0.01
ICU <u>or</u> step-down admission	Ref	0.76 (0.55-1.04)	1.21 (0.88-1.66)	1.68 (1.20-2.36)	< 0.01

* From hierarchical regression models accounting for demographics, comorbidities, acute organ failures, and hospital characteristics

Table E8. Outcomes associated with composite exposure consisting of use of trans-thoracic echocardiogram, cardiac troponin, or beta-natriuretic peptide within four days of hospital admission: hospital-level exposure and patient-level outcomes (N=64,022)

Outcome	Hospital RV-strain workup rate for PE				p-value*
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
	0-33%	33-42%	42-52%	52-89%	
Mortality (OR, 95% CI)	Ref	0.93 (0.74-1.16)	0.91 (0.73-1.13)	0.82 (0.65-1.04)	0.42
ICU admission	Ref	1.00 (0.76-1.30)	1.19 (0.91-1.55)	1.32 (1.00-1.73)	0.04
Thrombolytic use	Ref	1.26 (0.84-1.88)	1.26 (0.85-1.86)	1.24 (0.83-1.87)	0.62
Major bleeding	Ref	0.80 (0.63-1.01)	0.81 (0.65-1.02)	0.99 (0.78-1.25)	0.09
Hospital LOS (RR, 95% CI)	Ref	1.01 (0.95-1.06)	1.04 (0.98-1.09)	1.05 (0.99-1.11)	0.28
Hospital costs (RR, 95% CI)	Ref	1.03 (0.97-1.10)	1.02 (0.96-1.09)	1.04 (0.97-1.11)	0.69

Right ventricular (RV) strain workup: composite exposure consisting of use of trans-thoracic echo, cardiac troponin, or beta natriuretic peptide, *LOS* length of stay, *PE* pulmonary embolism

* From hierarchical regression models accounting for demographics, comorbidities, acute organ failures, and hospital characteristics

Table E9. Outcomes associated with trans-thoracic echocardiogram use on hospital day 0 or day 1: hospital-level exposure and patient-level outcomes (N=64,299)

Outcome	Hospital echocardiogram (day 0 or day 1) rate for pulmonary embolism				p-value *
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
	0-7%	7-12%	12-18%	18-45%	
Mortality (OR, 95% CI)	Ref	1.19 (0.96-1.48)	0.98 (0.79-1.22)	1.12 (0.89-1.39)	0.21
ICU admission	Ref	1.19 (0.99-1.55)	1.24 (0.95-1.62)	1.43 (1.09-1.87)	0.07
Thrombolytic use	Ref	1.21 (0.81-1.81)	1.49 (1.01-2.21)	1.49 (1.00-2.23)	0.15
Major bleeding	Ref	0.99 (0.79-1.25)	0.95 (0.76-1.20)	0.90 (0.71-1.14)	0.79
Hospital LOS (RR, 95% CI)	Ref	1.04 (0.99-1.10)	1.01 (0.95-1.06)	1.00 (0.95-1.06)	0.35
Hospital costs (RR, 95% CI)	Ref	1.08 (1.02-1.15)	1.06 (0.99-1.13)	1.12 (1.05-1.19)	< 0.01

LOS length of stay. * From hierarchical regression models accounting for demographics, comorbidities, acute organ failures, and hospital characteristics

Table E10. Outcomes associated with trans-thoracic echocardiogram use on hospital day 0 or day 1: patient-level exposure and patient-level outcomes (N=64,299)

Outcome	Cohort mean	Adjusted effect	
		estimate (95% CI)*	p-value
Mortality	2.0 %	0.95 (0.80-1.12)	0.51 †
ICU admission	19.3 %	1.93 (1.80-2.07)	< 0.01 †
Thrombolytic use	1.3 %	3.88 (3.30-4.57)	< 0.01 †
Major bleeding	2.9 %	1.32 (1.17-1.51)	< 0.01 ‡
Hospital LOS (days)	5.4 ± 4.2	1.04 (1.02-1.05)	< 0.01 §
Hospitalization cost (USD)	\$ 9,587 ± 10,298	1.18 (1.16-1.20)	< 0.01

LOS length of stay USD U.S. dollars

* Adjusted effect estimates: hazard ratio (mortality, ICU admission, thrombolytic use), odds ratio (major bleeding), relative proportion (hospital LOS, hospital costs)

† From Cox proportional hazard models with robust sandwich estimators

‡ From mixed effects logistic regression models

§ From mixed effects negative binomial regression model

|| From mixed effects linear regression model of log costs

Table E11. Association between trans-thoracic echocardiogram use on hospital day 0 or 1 and ICU admission on/after hospital day 2: hospital-level exposure and patient-level outcomes (N=64,299)

Outcome	Hospital echocardiogram (day 0 or day 1) rate for pulmonary embolism				p-value*
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
	0-7%	7-12%	12-18%	18-45%	
ICU admission (OR, 95% CI), hospital day 2 or later	Ref	1.01 (0.79-1.30)	0.90 (0.70-1.16)	0.90 (0.70-1.18)	0.69
ICU <u>or</u> step-down admission, hospital day 2 or later	Ref	1.06 (0.79-1.44)	0.89 (0.66-1.21)	0.86 (0.63-1.18)	0.50

* From hierarchical regression models accounting for demographics, comorbidities, acute organ failures, and hospital characteristics