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## Supplemental Tables

### Supplemental Table I.

The American Association for Surgery of Trauma-defined International Classification of Diseases, 9th revision, Clinical Modification Emergency General Surgery Diagnosis Groups and Conditions

Diagnosis Group	Conditions
Resuscitation	acute respiratory failure, shock
General abdominal conditions	abdominal pain, abdominal mass, peritonitis
Intestinal obstruction	adhesion, incarcerated hernia, cancer, volvulus, intussusception
Upper gastrointestinal tract	upper gastrointestinal bleed, peptic ulcer disease, fistula, gastrostomy, small intestinal cancer, ileus, Meckel's, bowel perforation, appendix
Hepatic-pancreatic-biliary	gallstones and related diseases, pancreatitis, hepatic abscess
Colorectal	lower gastrointestinal bleed, diverticular disease, inflammatory bowel disease, colorectal cancer, colitis, colonic perforation, megacolon, regional enteritis, colostomy/ ileostomy, hemorrhoid, perianal and perirectal fistula and infection, anorectal stenosis, rectal prolapse
Hernias	inguinal, femoral, umbilical, incisional, ventral, diaphragmatic
Soft tissue	cellulitis, abscess, fasciitis, wound care, pressure ulcer, compartment syndrome
Vascular	ruptured aneurysm, acute intestinal ischemia, acute peripheral ischemia, phlebitis
Cardiothoracic	cardiac tamponade, empyema, pneumothorax, esophageal perforation
Other	tracheostomy, foreign body, bladder rupture

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**Supplemental Table II.**

International Classification of Diseases, 9th revision, Clinical Modification Diagnosis Codes for In-hospital Complications

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Urinary	
Acute Renal Failure	584
Postoperative urinary retention or urinary tract infection	997.5
Acute urinary tract infection	996.64, 590.10-1, 590.80
Mechanical Wound	
Delayed wound healing	998.83
Postoperative hematoma	998.12
Postoperative seroma (non-infected)	998.13
Disruption of operative wound	998.30-2
Persistent postoperative fistula	998.6
Reopening of a laparotomy/reclosure of a postoperative disruption of abdominal wall	54.12, 54.61
Infections	
Post-operative infection/surgical site infection	958.3, 998.50-1, 998.59
<i>Clostridium difficile</i> colitis	008.45
Bacterial meningitis	320.0-3, 320.7-8, 320.80-2, 320.89, 320.9
Sepsis/septicemia	038.0-4, 038.10-2, 038.19, 038.40-4, 038.49, 038.8-9, 995.91-2
Acute lymphadenitis	683
Catheter associated infection	999.31
Pulmonary	
Pulmonary failure/pulmonary edema	518.81-2, 518.4-5, 518.8
Pneumonia	481, 482.0-4, 482.30-2, 482.39, 482.40-2, 482.49, 482.8-9, 482.81-4, 482.89, 483, 484, 485, 507.0, 997.31, 510.0, 510.9
Mediastinal infections	513.1, 519.2
Post-pulmonary complications	997.32, 997.39, 512.1-2, 997.3
Gastrointestinal Tract	
Postoperative bowel obstruction/ileus or other digestive system complications	997.4, 997.49
Gastrointestinal bleeding	530.82, 531.0, 531.00-1, 531.2, 531.20-1, 531.4, 531.40-1, 531.6, 531.60-1, 532.0, 532.00-1, 532.2, 532.20-1, 532.4, 532.40-1, 532.6, 532.60-1, 533.0, 533.00-1, 533.2, 533.20-1, 533.4, 533.40-1, 533.6, 533.60-1, 534.0, 534.00-1, 534.2, 534.20-1, 534.4, 534.40-1, 534.6, 534.60-1, 535.01, 535.11, 535.21, 535.31, 535.41, 535.51, 535.61, 578.9
Cardiovascular	

Deep vein thrombosis/pulmonary embolism	415.1, 415.11, 451.11, 451.19, 451.2, 451.81, 453.8, 997.79, 453.4, 453.40-2
Postoperative stroke	997.02
Postoperative phlebitis or thrombophlebitis	997.2
Cardiac arrest/insufficiency during or resulting from a procedure	997.1
Myocardial infarction	410.0-9, 410.00-1, 410.10, 410.11, 410.20-1, 410.3-1, 410.40-1, 410.5-1, 410.60-1, 410.70-1, 410.80-1, 410.90-1
Procedural	
Accidental puncture or laceration	998.2
Retained foreign body	998.4
Bleeding/hemorrhage/shock	998.11, 998.0-1, 995.4
Air embolism	999.1
Other complications of procedure not otherwise specified (includes post-op fever)	998.89, 998.9
Systemic	
Transfusion reaction	999.6-8, 999.60-3, 999.69, 999.7, 999.70-9, 999.80-1, 999.83-5, 999.88-9
iatrogenic shock/hypotension	485.2, 995.4

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**Supplementary Table III.**

Complications in Encounters of Emergency General Surgery Patients by Transfer Status in the Nationwide Inpatient Sample (2008-2011)

Complications, % (n)	Transferred (n= 274,145)	Directly Admitted (n= 10,456,100)	P value
Urinary Tract	13.7 (37,601)	8.1 (849,883)	<0.0001
Acute Renal Failure	13.3 (36,514)	7.7 (809,743)	<0.0001
Postoperative urinary retention or urinary tract infection	0.2 (592)	0.2 (19,446)	0.1385
Acute urinary tract infection	0.4 (1,038)	0.3 (30,680)	0.0003
Mechanical Wound	1.6 (4,261)	0.6 (61,826)	<0.0001
Delayed wound healing	0.2 (457)	0.1 (6,862)	<0.0001
Postoperative hematoma	0.6 (1,515)	0.2 (21,685)	<0.0001
Postoperative seroma (non-infected)	0.1 (390)	0.1 (7,701)	<0.0001
Disruption of operative wound	0.6 (1,545)	0.2 (21,466)	<0.0001
Persistent postoperative fistula	0.2 (571)	0.1 (6,312)	<0.0001
Reopening of a laparotomy/reclosure of a postoperative disruption of abdominal wall	0	0.001 (110)	
Infections	9.9 (27,047)	6.2 (647,808)	<0.0001
Post-operative infection/surgical site infection	1.2 (3,289)	0.6 (60,300)	<0.0001
<i>Clostridium difficile</i> colitis	4.0 (10,961)	4.0 (413,882)	0.7502
Bacterial meningitis	0.007 (*)	0.002 (39)	0.0056
Sepsis/septicemia	5.2 (14,341)	2.0 (205,837)	<0.0001
Acute lymphadenitis	0.01 (33)	0.02 (2,187)	0.1370
Catheter associated infection	0.5 (1,453)	0.1 (13,766)	<0.0001
Pulmonary	13.3 (36,391)	5.1 (532,680)	<0.0001
Pulmonary failure/pulmonary edema	10.4 (28,525)	3.9 (403,765)	<0.0001
Pneumonia	4.5 (12,408)	1.4 (144,355)	<0.0001
Mediastinal infections	0.1 (385)	0.01 (1,019)	<0.0001
Post-pulmonary complications	1.2 (3,191)	0.7 (70,247)	<0.0001
Gastrointestinal Tract	12.9 (35,465)	10.9 (1,136,753)	<0.0001
Postoperative bowel obstruction/ileus or other digestive system complications	2.3 (6,377)	1.6 (170,035)	<0.0001
Gastrointestinal bleed	10.7 (29,359)	9.3 (972,315)	<0.0001
Cardiovascular	5.5 (15,027)	2.3 (235,654)	<0.0001
Deep vein thrombosis/pulmonary embolism	3.1 (8,546)	1.3 (135,544)	<0.0001
Postoperative stroke	0.04 (113)	0.01 (1,371)	<0.0001
Postoperative phlebitis or thrombophlebitis	0.1 (297)	0.03 (3,259)	<0.0001
Cardiac arrest/insufficiency	0.6 (1,581)	0.3 (31,294)	<0.0001

during or resulting from procedure			
Myocardial infarction	2.0 (5,481)	0.7 (76,596)	<0.0001
Procedural	2.3 (6,432)	1.1 (112,300)	<0.0001
Accidental puncture or laceration	0.8 (2,218)	0.4 (42,624)	<0.0001
Retained foreign body	0.02 (44)	0.008 (791)	0.0003
Bleeding/hemorrhage/shock	1.5 (4,084)	0.6 (64,458)	<0.0001
Air embolism	0	0.0002 (26)	
Other complications of procedure not otherwise specified (includes post-operative fever)	0.1 (330)	0.08 (8,176)	0.0005
Systemic	0.08 (231)	0.05 (5,504)	0.0023
Transfusion reaction	0.08 (227)	0.05 (5,433)	0.003
Iatrogenic shock/hypotension	0.002 (*)	0.0007 (71)	0.3869
None	61.2 (167,833)	73.9 (7,731,883)	<0.0001

388 \*Number suppressed due to small cell size

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**Supplemental Table IV.**

Factors Associated with Outcomes of Encounters of Emergency General Surgery Patients in the Nationwide Inpatient Sample (2008-2011)

Patient-Level Characteristics	Mortality Adjusted Odds Ratio (95% CI)	Morbidity Adjusted Odds Ratio (95% CI)	Length of Stay (log(days)) Estimated Regression Coefficient (x100) (SE)	Cost (log(\$)) Estimated Regression Coefficient (x100) (SE)
<b>Transfer status</b>				
Directly admitted	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Transferred	1.7 (1.6-1.8)*	1.4 (1.3-1.4)*	15.8 (0.9)*	8.2 (1.9)*
<b>Gender</b>				
Female	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Male	1.1 (1.1-1.1)*	1.2 (1.2-1.2)*	2.7 (0.0)*	0.7 (652)
<b>Age</b>				
	1.0 (1.0-1.0)*	1.0 (1.0-1.0)*	0.4 (0.0)*	0.2 (0.0)*
<b>Race</b>				
White	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Black	1.0 (0.9-1.0) <sup>‡</sup>	1.0 (1.0-1.1) <sup>‡</sup>	3.5 (0.4)*	5.7 (0.8)*
Hispanic	0.9 (0.9-1.0) <sup>‡</sup>	0.8 (0.8-0.9)*	0.1 (0.5)	3.7 (1.1) <sup>†</sup>
Other	1.0 (0.9-1.1)	0.9 (0.9-1.0)*	-1.7 (0.7) <sup>†</sup>	3.0 (1.1) <sup>†</sup>
Missing	1.0 (1.0-1.1)	1.0 (1.0-1.1)	-1.5 (0.7)	-3.6 (1.5) <sup>‡</sup>
<b>Primary Insurance</b>				
Private insurance	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Medicare	0.9 (0.9-1.0) <sup>†</sup>	1.2 (1.2-1.2)*	6.4 (0.2)*	5.1 (0.3)*
Medicaid	1.3 (1.2-1.4)*	1.2 (1.2-1.2)*	8.1 (0.3)*	6.4 (0.6)*
Other	1.3 (1.2-1.4)*	1.0 (1.0-1.0)	0.8 (0.3) <sup>†</sup>	0.1 (0.6)
<b>Median household income national quartile</b>				
0-25 <sup>th</sup>	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
26 <sup>th</sup> -50 <sup>th</sup>	1.0 (0.9-1.0)	1.0 (1.0-1.0)	-1.1 (0.3) <sup>†</sup>	2.7 (0.6)*
51 <sup>st</sup> -75 <sup>th</sup>	0.9 (0.9-1.0)*	1.0 (1.0-1.0)	-2.5 (0.4)*	3.9 (0.8)*
76 <sup>th</sup> -100 <sup>th</sup>	0.9 (0.8-0.9)*	1.0 (1.0-1.0)	-4.3 (0.6)*	7.3 (1.2)*
<b>Charlson Comorbidity Index</b>				
0	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
1	1.4 (1.3-1.4)*	1.4 (1.4-1.5)*	8.4 (0.1)*	10.3 (0.2)*
2	1.8 (1.8-1.9)*	1.9 (1.9-2.0)*	14.0 (0.2)*	17.7 (0.3)*
3 or more	2.8 (2.7-2.9)*	2.6 (2.5-2.6)*	20.2 (0.3)*	26.2 (0.4)*
<b>EGS Diagnosis Group (Reference is no for each diagnosis)</b>				
Resuscitation	6.0 (4.6-8.0)*	2.9 (2.3-3.6)*	30.3 (2.6)*	33.3 (3.1)*
General				
abdominal conditions	1.0 (0.8-1.2)	0.2 (0.2-0.2)*	11.6 (1.6)*	11.1 (1.5)*
Intestinal obstruction	1.2 (1.0-1.5)	0.3 (0.3-0.3)*	30.5 (1.5)*	12.4 (1.5)*
Upper gastrointestinal tract	0.7 (0.5-0.8)*	2.5 (2.3-2.8)*	4.5 (1.5) <sup>†</sup>	3.2 (1.5)*

Hepatic-pancreatic-biliary	1.1 (0.9-1.4)	0.3 (0.2-0.3)*	37.3 (1.5)*	30.0 (1.5)*
Colorectal	0.7 (0.6-0.8) <sup>†</sup>	0.6 (0.6-0.7)*	29.0 (1.5)*	13.4 (1.5)*
Hernias	1.0 (0.8-1.2)	0.3 (0.3-0.4)*	5.2 (1.5) <sup>†</sup>	8.6 (1.5)*
Soft tissue	0.5 (0.4-0.6)*	0.2 (0.2-0.3)*	35.8 (1.5)*	1.4 (1.6)
Vascular	3.3 (2.6-4.0)*	0.5 (0.4-0.5)*	33.7 (1.5)*	29.0 (1.5)*
Cardiothoracic	1.0 (0.8-1.3)	7.6 (6.7-8.8) <sup>‡</sup>	34.0 (2.1)*	31.4 (2.1)*
Procedure Type				
No procedure	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Colon	1.3 (1.3-1.4)*	1.8 (1.7-1.9)*	84.5 (0.5)*	117.7 (0.6)*
Amputation	1.0 (0.8-1.3)	1.7 (1.5-1.8)*	65.8 (1.4)*	94.4 (1.5)*
Anorectal	0.3 (0.2-0.4)*	0.3 (0.3-0.3)*	-7.1 (0.7)*	15.8 (0.8)*
Appendix	0.3 (0.3-0.4)*	0.1 (0.1-0.1)*	-3.9 (0.5)*	60.2 (0.7)*
Bladder	1.1 (0.7-1.8)	2.0 (1.6-2.4)*	80.4 (2.7)*	99.2 (2.8)*
Cardiothoracic	0.6 (0.5-0.7)*	1.5 (1.3-1.6)*	38.5 (1.4)*	45.6 (1.6)*
Gallbladder	0.3 (0.3-0.3)*	1.1 (1.1-1.1)*	1.0 (0.5)	51.6 (0.6)*
Ear, nose, and throat	1.6 (1.3-1.9)*	13.1 (10.9-15.7)*	88.9 (2.3)*	137.2 (2.4)*
Exploratory laparotomy	8.7 (7.6-9.9)*	3.0 (2.7-3.3)*	75.5 (1.3)*	89.2 (1.4)*
Stomach	1.2 (1.1-1.2) <sup>†</sup>	2.3 (2.2-2.4)*	35.6 (0.6)*	54.3 (0.7)*
Hernia	0.6 (0.5-0.7)*	1.2 (1.2-1.3)*	20.6 (0.6)*	56.0 (0.8)*
Laparoscopy	2.3 (1.7-3.2)*	1.0 (0.9-1.2)	38.7 (1.5)*	74.8 (1.2)*
Hepatobiliary	0.9 (0.7-1.2)	3.4 (3.0-3.8)*	64.5 (1.9)*	103.3 (2.5)*
Lysis of adhesions	0.7 (0.7-0.8)*	2.4 (2.3-2.5)*	64.1 (0.6)*	94.0 (0.6)*
Orthopedic or soft tissue	1.0 (0.9-1.1)	1.1 (1.1-1.1)*	23.3 (0.4)*	36.4 (0.5)*
Pancreas	1.3 (1.0-1.7) <sup>†</sup>	5.2 (4.7-5.7)*	111.0 (1.9)*	135.1 (2.2)*
Kidney	1.7 (0.4-7.0)	3.5 (1.6-7.4) <sup>‡</sup>	74.7 (10.4)*	99.1 (10.3)*
Small bowel	1.2 (1.1-1.3)*	4.2 (4.0-4.3)*	79.3 (0.5)*	108.0 (0.6)*
Vascular	0.9 (0.8-1.0) <sup>†</sup>	2.5 (2.4-2.6)*	38.6 (0.6)*	92.9 (0.8)*
Day of the week of admission				
Monday-Friday	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Saturday-Sunday	1.0 (1.0-1.1) <sup>†</sup>	1.0 (1.0-1.0)	1.1 (0.1)*	1.5 (0.1)*
Complications <sup>^</sup>				
None	1 (Reference)	N/A	0 (Reference)	0 (Reference)
1-2	4.5 (4.4-4.7)*	N/A	34.1 (0.2)*	33.9 (0.2)*
≥3	36.0 (34.3-37.7)*	N/A	108.9 (0.6)*	123.4 (0.7)*
Hospital-Level Characteristics				
Total number of discharges	1.0 (1.0-1.0) <sup>†</sup>	1.0 (1.0-1.0)	0.0 (0.0)	0.0 (0.0) <sup>‡</sup>
United States Region				

Northeast	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Midwest	0.78 (0.7-0.8)*	1.1 (1.0-1.1) <sup>†</sup>	-7.0 (1.0)*	-6.6 (2.4) <sup>†</sup>
South	0.9 (0.8-0.9)*	1.1 (1.1-1.2)*	-2.9 (1.0) <sup>†</sup>	-10.9 (2.5)*
West	0.8 (0.8-0.9)*	1.2 (1.1-1.3)*	-11.2 (1.0)*	8.1 (2.6) <sup>‡</sup>
Hospital Control/Ownership				
Private, nonprofit	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Government, nonfederal	1.2 (1.2-1.3)*	1.0 (0.9-1.0) <sup>†</sup>	2.3 (0.8) <sup>†</sup>	6.7 (1.9) <sup>†</sup>
Private, invest-own	1.0 (0.9-1.1)	1.0 (0.9-1.0) <sup>†</sup>	-0.1 (0.7)	-6.9 (1.4)*
Bed size				
Large	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Small	1.0 (0.9-1.0)	0.9 (0.9-1.0)*	-7.0 (0.7)*	5.5 (1.7) <sup>†</sup>
Medium	1.0 (0.9-1.0)	1.0 (0.9-1.0) <sup>‡</sup>	-3.3 (0.7)*	3.6 (1.8) <sup>‡</sup>
Hospital location				
Urban teaching	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
Rural	1.12 (1.1-1.2) <sup>†</sup>	0.9 (0.8-0.9)*	-8.5 (0.9)*	0.2 (2.2)
Urban, non-teaching	0.9 (0.9-1.0) <sup>‡</sup>	1.0 (0.9-1.0) <sup>‡</sup>	-1.9 (0.7) <sup>†</sup>	-0.5 (1.8)
Year				
2011	1 (Reference)	1 (Reference)	0 (Reference)	0 (Reference)
2010	1.1 (1.0-1.1) <sup>‡</sup>	1.0 (1.0-1.0)	1.8 (0.5) <sup>†</sup>	0.5 (1.2)
2009	1.2 (1.1-1.2)*	1.0 (1.0-1.0)	3.2 (0.6)*	-1.4 (1.2)
2008	1.3 (1.2-1.4)*	0.9 (0.9-1.0)*	5.6 (0.5)*	0.7 (1.2)

\*p<0.0001, <sup>†</sup>p<0.01, <sup>‡</sup>p<.05; ^Number of complications at the level of the individual complication as described in Supplementary Table III

CI: Confidence Interval; SE: Standard Error