Supplementary Online Content


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This supplementary material has been provided by the authors to give readers additional information about their work.
eAppendix 1. Revenue Center Codes for Intensive Care Unit Use

0200 – Intensive care – general classification
0201 – Intensive care – surgical
0202 – intensive care – medical
0209 – intensive care – other intensive care
0210 – coronary care – general classification
0211 – coronary care – myocardial infarction
0212 – coronary care – pulmonary care
0219 – coronary care – other coronary care
eAppendix 2. Covariates in Logistic Generalized Estimating Equations

Hospital-Level Covariates
- Total number of beds
- Teaching vs. non-teaching hospital (membership in the Council of Teaching Hospitals)
- Hospital capacity (diagnostic catheterization only, percutaneous intervention without surgery, full surgical capabilities, or none)
- Urban vs. rural location
- Region (Northeast, West, Midwest, or South)

Patient-Level Covariates
- Demographics: age, sex, race, weight (kg)
- Signs and symptoms at presentation: heart failure, heart rate (bpm), systolic blood pressure (mmHg)
- Medical history: hypertension, diabetes mellitus, current/recent smoker (< 1 year), dyslipidemia, prior myocardial infarction, prior percutaneous intervention, prior coronary artery bypass grafting, prior heart failure, prior stroke, prior peripheral arterial disease
- Laboratory results: initial hemoglobin (g/dl), initial serum creatinine (mg/dl), initial troponin ratio (× upper limit of normal)
- Home medications: aspirin, clopidogrel, warfarin, beta blocker, ACE inhibitor, ARB, aldosterone antagonist, statin, non-statin lipid lowering agent
eAppendix 3. Diagnostic and Procedure ICD-9 Codes Mandating ICU-Level Care

**Hemodynamic compromise requiring medication or mechanical support**
- 39.65 extracorporeal membrane oxygenation
- 37.60 implantation of biventricular external heart assist system
- 37.61 insertion of pulsation balloon
- 37.62 insertion of temporary non-implantable extracorporeal circulatory assist device
- 37.65 implant of single ventricular extracorporeal external heart assist system
- 37.66 implant of an implantable, pulsatile heart assist system
- 37.68 insertion of percutaneous external heart assist device
- 785.50 shock, unspecified
- 785.51 cardiogenic shock
- 785.52 septic shock
- 785.59 other shock without mention of trauma

**Need for cardiopulmonary resuscitation**
- 99.60 CPR
- 427.5 cardiac arrest
- 427.42 ventricular flutter
- 427.41 ventricular fibrillation

**Arrhythmia requiring pacing**
- 37.78 insertion of temporary transvenous pacemaker system
- 426.0 atrioventricular block, third degree

**Mechanical complication post-MI**
- 429.5 rupture of chordae tenineae
- 429.6 rupture of papillary muscle
- 429.71 certain sequelae of myocardial infarction not elsewhere classified acquired cardiac septal defect

**Respiratory failure**
- 96.04 insertion of endotracheal tube
- 96.70-96.72 mechanical ventilation
- 518.5 ARDS
- 518.81 respiratory failure, acute
- 799.1 respiratory arrest

**Stroke or intracranial hemorrhage**
- 430 subarachnoid hemorrhage
- 431 intracerebral hemorrhage
- 432.9 other and unspecified intracranial hemorrhage
- 434.01 cerebral thrombosis with cerebral infarction
- 434.11 cerebral embolism with cerebral infarction
# Conditions Mandating ICU-Level Care at Low, Intermediate, and High ICU Use Hospitals

<table>
<thead>
<tr>
<th>Complication mandating ICU-level care</th>
<th>Overall (n = 8,900 patients)</th>
<th>Low ICU Utilization (n = 15,580 patients)</th>
<th>Intermediate ICU Utilization (n = 3,538 patients)</th>
<th>High ICU Utilization (n = 15,580 patients)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complication mandating ICU-level care</td>
<td>4396 (15.7)</td>
<td>1183 (13.3)</td>
<td>2621 (16.8)</td>
<td>592 (16.7)</td>
<td>&lt; 0.001</td>
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<tr>
<td>Cardiac arrest</td>
<td>958 (3.4)</td>
<td>252 (2.8)</td>
<td>594 (3.8)</td>
<td>112 (3.2)</td>
<td>&lt; 0.001</td>
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<tr>
<td>Shock</td>
<td>1641 (5.9)</td>
<td>433 (4.9)</td>
<td>990 (6.4)</td>
<td>218 (6.2)</td>
<td>&lt; 0.001</td>
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<tr>
<td>Respiratory failure</td>
<td>2926 (10.4)</td>
<td>781 (8.8)</td>
<td>1759 (11.3)</td>
<td>386 (10.9)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>AV block requiring treatment</td>
<td>381 (1.4)</td>
<td>109 (1.2)</td>
<td>227 (1.5)</td>
<td>45 (1.3)</td>
<td>0.28</td>
</tr>
<tr>
<td>Stroke</td>
<td>268 (1.0)</td>
<td>67 (0.8)</td>
<td>167 (1.1)</td>
<td>34 (1.0)</td>
<td>0.05</td>
</tr>
</tbody>
</table>

* Data presented as frequency (percent). Low ICU utilization hospitals treat < 30% of older NSTEMI patients in the ICU, intermediate ICU utilization hospitals treat 30-70% of older NSTEMI patients in the ICU, and high ICU utilization hospitals treat > 70% of older NSTEMI patients in the ICU. AV; atrioventricular. Complication mandating ICU care defined as per Appendix 3. Cardiac arrest defined as per the ACTION data collection form (DCF) or ICD-9 codes listed under “Need for cardiopulmonary resuscitation” in Appendix 3. Shock defined as cardiogenic shock per the ACTION DCF or any ICD-9 code listed under “Hemodynamic compromise requiring medication or support” and “Mechanical complication post-MI” in Appendix 3. Respiratory failure defined as any ICD-9 code listed under “Respiratory failure” in Appendix 3. AV block requiring treatment defined as ICD-9 listed under “Arrhythmia requiring pacing” in Appendix 3. Stroke defined as per the ACTION DCF or ICD-9 codes listed under “Stroke or intracranial hemorrhage” in Appendix 3.
eFigure. Between-Hospital Variability in ICU Use Among Uncomplicated Patients

Median (25th, 75th percentiles) 30% (19%, 47%)