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## Hospital-based, acute care utilization among patients recently discharged from the hospital

Anita A. Vashi, MD, MPH<sup>1,2,3</sup>, Justin P. Fox, MD, MHS<sup>4</sup>, Brendan G. Carr, MD, MS<sup>5</sup>, Gail D'Onofrio, MD, MS<sup>3</sup>, Jesse M. Pines, MD, MBA, MSCE<sup>6</sup>, Joseph S. Ross, MD, MHS<sup>1,7,8</sup>, and Cary P. Gross, MD<sup>1,7,9</sup>

<sup>1</sup>Robert Wood Johnson Foundation Clinical Scholars Program, Yale University School of Medicine, New Haven CT

<sup>2</sup>Department of Veterans Affairs/VA Connecticut Healthcare System, West Haven, CT, USA

<sup>3</sup>Department of Emergency Medicine, Yale University School of Medicine, New Haven CT

<sup>4</sup>Department of Surgery, Boonshoft School of Medicine, Wright State University, Dayton Ohio

<sup>5</sup>Departments of Emergency Medicine & Biostatistics & Epidemiology, University of Pennsylvania, Philadelphia PA

<sup>6</sup>Departments of Emergency Medicine and Health Policy, George Washington University, Washington DC

<sup>7</sup>Section of General Internal Medicine, Yale University School of Medicine, New Haven CT

<sup>8</sup>Center for Outcomes Research and Evaluation, Yale–New Haven Hospital, New Haven Connecticut

<sup>9</sup>Cancer Outcomes Policy and Effectiveness Research (COPPER) Center, Yale University School of Medicine and Yale Comprehensive Cancer Center, New Haven CT

### Abstract

**Context**—Current efforts to improve and coordinate healthcare rely on hospital readmission rates as a marker of quality and transitions in care during the post acute care period. Emergency department (ED) visits are also a marker of hospital based acute care needs following discharge but little is known about ED utilization in this period.

**Objective**—We studied patients who were discharged from acute care hospitals to 1) determine the degree to which ED visits and hospital readmissions contribute to overall use of acute care services within 30-days of hospital discharge; 2) describe the reasons patients return for ED visits;

Corresponding/Reprints Author: Anita Vashi MD, 333 Cedar Street, SHM-1E-61, PO Box 208088, New Haven, CT, 06520-8088, P: 734-678-8660 F: 203-785-3461, anita.vashi@yale.edu.

**Author Contributions:** Anita Vashi and Cary Gross had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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and 3) describe these patterns among Medicare beneficiaries and those not covered by Medicare insurance.

**Design, Setting, and Participants**—Using the Healthcare Cost and Utilization Project State Inpatient and Emergency Department Databases, we identified adult patients discharged from acute care hospitals in three large, geographically diverse states (California, Florida and Nebraska) between July 2008 and September 2009.

**Main Outcome Measures**—We defined three primary outcomes during the 30-day period after hospital discharge: ED visits not resulting in admission (treat-and-release encounters), hospital readmissions from any source, and a combined measure of ED visits and hospital readmissions termed hospital-based, acute care.

**Results**—Our final cohort included 5,032,254 index hospitalizations among 4,028,555 unique patients. Nearly 18% (95% confidence interval (CI), 17.9–18.0) of hospitalizations in our study resulted in at least one acute care encounter in the 30 days following discharge. For every 1,000 discharges, there were 97.5 ED (95% CI, 97.2–97.8) treat-and-release visits and 147.6 (95% CI, 147.3–147.9) hospital readmissions in the 30 days following discharge. ED visits comprised 39.8% (95% CI, 39.7–39.9) of the 1,233,402 acute care encounters. Hospital-based, acute care encounters ranged from 42.1 (95% CI, 41.5–42.7)–947.5 (95% CI, 896.3–1001.0) encounters per 1,000 hospital discharges across 470 unique conditions. Among the highest volume discharges, the most common reason patients returned to the ED was always related to their index hospitalization.

**Conclusions**—Among adult hospitalizations from acute care hospitals in three states, ED visits within thirty days were common and accounted for 39.8% of post-discharge hospital-based, acute care visits.

## Keywords

Emergency department visits; readmission; health services research; care transitions

## Introduction

Hospital readmissions within 30-days of discharge are common, costly, and often related to the index hospitalization.<sup>1–5</sup> Increasingly, a hospital's readmission rate is being viewed as a marker of the quality of care provided to patients and the effectiveness of the discharge process as patient care transitions to the outpatient setting.<sup>6–7</sup> Focusing solely on hospital readmissions, however, may be too narrow and provide an incomplete picture of hospital-based, acute care utilization following discharge.

Emergency department (ED) visits are another important outcome following hospital discharge – even when they do not result in hospital admission. A return to the ED after hospital discharge often reflects poorly executed transitions in care and has the potential to result in fragmentation of care following discharge.<sup>8–10</sup> ED utilization in the post discharge period is also increasingly being interpreted by policymakers as an important measure in monitoring and evaluating innovative care delivery programs.<sup>11–14</sup> Despite the clinical and policy relevance, patterns of emergency care utilization among recently discharged patients are poorly understood. Existing studies have been limited by failing to differentiate ED visits that result in readmission from those that result in discharge, or have tended to focus on the experience at a single institution, a single payer, or specific condition.<sup>15–26</sup> Consequently, providers and policymakers may be underestimating the extent of patients' hospital-based, acute care needs after discharge.

To address this knowledge gap we studied hospital-based, acute care encounters in the 30 days following hospital discharge. Using large, population-based, multi-payer databases

from three geographically dispersed states, we identified patients who were discharged from acute care hospitals to 1) determine the degree to which ED visits (treat-and-release encounters) and hospital readmissions contribute to overall use of acute care services within 30-days of hospital discharge overall as well as within condition-specific subgroups; 2) describe the clinical diagnoses leading to return ED treat-and-release visits and 3) given recent attention to improving care transitions among Medicare beneficiaries, describe these patterns among Medicare beneficiaries and those not covered by Medicare insurance.

## Methods

### Databases

We identified patients from the 2008 and 2009 California, Florida and Nebraska Healthcare Cost and Utilization Project (HCUP) State Inpatient (SID) and Emergency Department Databases (SEDD). These states were selected for their geographic distribution, data quality and chiefly because their databases contain unique patient identifiers that allow patients to be followed over time and across the inpatient and ED settings. These data are collected at the state-level and made publically available through the Agency for Healthcare Research and Quality.<sup>27-28</sup> The inpatient databases include all inpatient discharges from short-term, acute-care, non-federal hospitals, including those admitted via the ED. In contrast, the ED databases are limited to treat-and-release encounters where patients presented to the ED and were not admitted to the hospital. Each hospital or ED discharge record includes socio-demographic, hospital, and clinical variables, as well as up to 25 diagnostic and 21 procedure codes based on *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) coding.<sup>29</sup> Records across both the state ED and inpatient databases were linked using an encrypted, patient-level identifier.

### Outcome Variables

We defined three primary 30-day outcomes for this study: 1) ED visits, defined as treat-and-release encounters, 2) all-cause hospital readmissions, and 3) a combined measure of ED treat-and-release visits and hospital readmissions termed hospital-based, acute care. Using HCUP's patient identifiers, we identified all ED treat-and-release visits from state ED databases and all hospital readmissions – regardless of whether the readmission was to the discharging hospital - from state inpatient databases for the population described above. In addition, we created a condition specific ED index defined as the ratio of the ED visit rate to the readmission rate, to delineate how ED treat-and-release visits contribute to overall post discharge, hospital-based acute care utilization at the condition level. A value greater than 1 indicates that ED visits not requiring admission were more frequent than readmissions. Conversely, a number less than 1 indicates patients were more frequently readmitted to the hospital than discharged from the ED.

### Descriptive variables

The primary unit of analysis was the hospital discharge. Index hospitalizations were classified by diagnosis related group, version 24 (DRG-24) at the time of patient discharge. All index discharges were flagged as either medical or surgical based on HCUP DRG Grouper processing. Additional patient variables used for analysis were selected from the time of index discharge and include age, sex, race and ethnicity (white, black, Hispanic, other, or missing), median income based on the patient's home zip code stratified into quartiles, and primary payer status (private, Medicare, Medicaid, or other). Information about reasons for post-discharge acute care encounters were collected from the diagnosis category associated with each encounter. Diagnosis categories are based on the AHRQ Clinical Classification Software (CCS), which groups all ICD-9 diagnosis codes into clinically meaningful, mutually exclusive diagnosis categories. AHRQ defined

comorbidities were defined based on ICD-9CM codes according to Elixhauser et. al.<sup>30</sup> These included dichotomous indicators for the presence or absence of 29 comorbidities and were summed to create a comorbidity score.

## Statistical analysis

We calculated descriptive statistics for the sample. We defined the rate of ED treat-and-release visits, hospital readmissions and overall hospital-based, acute care in the following way: the total number of respective encounters (i.e. ED visits, readmissions) within 30-days of index discharge divided by the total number of discharges from acute care hospitals. In this way, multiple visits to the ED or multiple readmissions by individual patients were uniquely captured. Similarly, we calculated condition specific rates by dividing the total number 30 day encounters among patients discharged within each DRG (numerator) by the total number of patients discharged with that DRG (denominator). All rates were expressed as total number of encounters per 1,000 discharges. A sensitivity analysis, using patient as the unit of analysis yielded similar results regarding the frequency of ED encounters and is described in greater detail in the on-line supplement. Confidence intervals (CI) for all rates were calculated using a Poisson analysis. All analyses were conducted using SAS version 9.2 (SAS Institute, Cary, North Carolina) and Stata (version 10, Stata Corp, College Station, Texas, USA). This study was considered exempt from review by the Yale University Human Investigations Committee.

## Results

### Patient selection

From the SID databases, we identified all California, Florida and Nebraska hospital discharges for residents aged 18 years and over between July 1, 2008 and September 31, 2009 (N = 6,735,565). From this population, we sequentially excluded discharges with missing disposition data (N = 14,137), those discharges where patients were discharged against medical advice (N = 89,280), died during their index hospitalization (N = 151,191), were transferred to another acute care facility (N = 94,737), were discharged after a hospitalization primarily requiring rehabilitation services (N = 102,068) or were missing a valid, encrypted patient identifier (N=371,687). Discharges by the same patient were excluded only if they occurred less than 31 days apart (N=879,706), as these events would represent one of our primary outcomes. Finally, to avoid including rare or miscoded conditions, we excluded discharges where patients were discharged with a diagnosis that was reported in the inpatient database fewer than 100 times (N = 505). After all exclusions, 5,032,254 discharges remained among 4,028,555 unique patients.

### Description of the sample

The mean age of patients in our cohort was 53.4 years with patients well distributed across all age groups. Patients 65 years old and above comprised 29.2% of the sample. The majority of patients were female (53.5%) and white (48.0%). The majority of patients had some form of insurance coverage (75.1%), with Medicare being the most common (29.9%) followed by private insurance (32.3%). Medicaid was the primary insurance for 15.3% of patients. Just over a quarter of patients (26.7%) had zero comorbidities, while 21.5% had 3 or more comorbid conditions. Patients had been discharged after index hospitalization for 470 unique conditions. Of these, medical discharges (65.2%) were more common than surgical discharges.

## Outcomes among all discharges

Nearly 18% (95% CI, 17.9–18.0) of hospitalizations in our study resulted in at least one acute care encounter in the 30 days following discharge; 7.5% (95% CI, 7.5–7.6) of discharges were followed by at least one ED encounter and 12.3% (95% CI, 12.3–12.3) by at least one readmission. For every 1,000 discharges, there were 97.5 (95% CI, 97.2–97.8) ED treat-and-release visits and 147.6 (95% CI, 147.3–147.9) hospital readmissions in the 30 days following discharge (Figure 1). ED visits comprised 39.8% (95% CI, 39.7–39.9) of the 1,233,402 post-discharge acute care encounters.

Approximately one-third of hospital-based, acute care utilization occurs in the first seven days following hospital discharge (35.3% (95% CI, 35.1–35.4) of ED visits and 31.9% (95% CI, 31.7–32.0) of readmissions), whereas over half occurs in the first 14 days (57.4% (57.2–57.6) of ED visits and 55.7% (95% CI, 55.5–55.9) of readmissions). About 57% (95% CI, 56.6–57.0) of the hospital readmissions were admitted through the ED.

## Outcomes among high-volume medical and surgical discharge diagnoses

ED visit, readmission and hospital-based acute care rates varied for the most common medical and surgical discharges (Table 1). In aggregate, these highest volume medical and surgical discharges accounted for 40% of all index discharges.

Among high volume medical conditions, 30-day post-discharge ED treat-and-release visit rates were highest for digestive disorders and psychoses (140.7 (95% CI, 138.1–143.3) and 219.4 (95% CI, 217.2–221.5) encounters/1,000 discharges respectively). Heart failure and psychoses accounted for the highest overall hospital-based acute care utilization rates (373.5 (95% CI, 370.0–377.0) and 470.8 (95% CI, 467.7–474.0) encounters/1,000 discharges respectively). Among high volume surgical conditions, complicated laparoscopic cholecystectomies and complicated cesarean sections accounted for the highest rates of ED treat-and-release visits (84.5 (95% CI, 81.3–87.8) and 84.6 (95% CI, 82.2–87.0) encounters/1,000 discharges respectively), while percutaneous coronary interventions and complicated hip and femur procedures accounted for the highest rates of overall hospital-based, acute care (233.6 (95% CI, 228.5–238.8) and 241.7 (95% CI, 236.4–247.1) encounters/1,000 discharges respectively). Although patients returned to the ED for a variety of reasons, for the high volume conditions, ED treat-and-release visits were always related to the index hospitalization. (Table 2).

## Variation in outcomes across all medical and surgical discharge diagnoses

There was substantial variability in utilization rates across the 470 different index discharge conditions (Figure 2). ED treat-and-release visits ranged from a low of 22.4 (95% CI, 4.6–65.4) encounters/1,000 discharges for breast malignancy to a high of 282.5 (95% CI, 209.7–372.4) encounters/1,000 discharges for uncomplicated benign prostatic hypertrophy. Conditions with the highest rates of ED visits were related to mental health, drug and alcohol abuse and benign prostatic hypertrophy. Readmissions were lowest following vaginal deliveries, cesarean sections and gynecological procedures and highest following admissions for false labor, chemotherapy and malignancy related hospitalizations, organ transplants and threatened abortions. Of the 470 index discharge conditions, 25.7% had higher ED revisit rates than readmission rates (ED index >1). The relationship between ED treat-and-release visits and readmissions, however, is condition specific. For example, hospitalizations for seizures and headache had similar ED treat-and-release revisit rates (197.6 (95% CI, 191.2–204.1) and 198.6 (95% CI, 190.8–206.7) ED visits/1,000 discharges respectively), while their respective readmission rates were considerably different (106.5 (95% CI, 100.8–112.4) and 184.5 readmissions (95% CI, 178.3–190.7)/1,000 discharges). Conversely, readmission rates were similar following septicemia, coronary bypass and



complicated kidney and ureter procedures (220.7 (95% CI, 217.5–223.9), 221.7 (95% CI, 204.9–239.5) and 221.0 (95% CI, 208.7–233.7) readmissions/1,000 discharges respectively) with varying rates of ED treat-and-release visits (81.6 (95% CI, 79.6–83.5), 101.2 (95% CI, 90.0–113.5) and 140.1 (95% CI, 130.4–150.3) ED visits/1,000 discharges respectively).

### Outcomes among Medicare beneficiaries

Patterns of hospital-based, acute care utilization varied between Medicare and non-Medicare covered patients, and is illustrated for the three most common medical and surgical conditions for each population (Figure 3). The overall hospital-based, acute care utilization for Medicare patients was 288.9 (95% CI, 288.2–289.7) per 1,000 discharges, while among non-Medicare patients, the rate was 212.1 encounters (95% CI, 211.7–212.7)/1,000 discharges. While Medicare patients returned to the ED at similar rates as non-Medicare patients (92.0 (95% CI, 91.6–92.5) and 101.6 (95% CI, 101.3–102.0) ED visits/1,000 discharges respectively), the readmission rate was 196.9 (95% CI, 196.3–197.5)/1,000 discharges for Medicare patients and 110.6 (95% CI, 110.2–111.0)/1,000 discharges for non-Medicare patients.

### Discussion

Our population based study of over four million adult patients in three states demonstrated high rates of hospital-based, acute care utilization following medical and surgical inpatient discharges. Nearly 18% of hospitalizations resulted in at least one acute care encounter in 30 days following discharge. Our study adds to prior work on hospital readmissions by showing that ED treat-and-release visits account for nearly 40% of all hospital-based, acute care utilization in the post discharge period. Focusing solely on readmissions would have missed nearly half a million ED treat-and-release encounters in these three states and substantially underestimated post acute care utilization. These ED visits are likely to result in fragmented care following discharge and consequently contribute to duplication of services, conflicting care recommendations, medication errors, patient distress, or higher costs.<sup>9</sup> Efforts to impact post acute care utilization should address ED care, which is likely to require a better understanding of the reasons patients seek care in the ED following discharge from the hospital.

While the optimal role of the ED in the post discharge period has yet to be clearly defined, high and varying rates of ED utilization suggest there is potential to improve acute care delivery. Some ED encounters involve critically ill, high-risk patients that will clearly require readmission. On the other hand, we found several conditions with high ED indices, meaning patients with these conditions were much more likely to be treated and released from the ED than readmitted. Because many of these patients presented to the ED for reasons related to their index admission, anticipating patient needs and developing an appropriate care plan prior to hospital discharge may help prevent some of these likely low acuity visits. Similarly, given that patients hospitalized for reasons related to mental illness and drug and alcohol abuse had especially high rates of return to the ED, we must reconsider how acute care can be best delivered and targeted to this population, outside of hospitals.

We also found that patterns of utilization varied by Medicare insurance status, which likely reflects the unique needs of an older adult population. Our results may be helpful to those that are targeting care transition interventions to older populations with the intention of decreasing ED visits and readmissions.<sup>6, 31</sup> CMS policies directed at reducing utilization and cost after hospital discharge should consider the implications of accounting for post-discharge ED use and hospital readmissions, both for patients and for discriminating hospital quality. However, it is important to note that ED use after discharge is not synonymous with a lapse in quality. In order to design interventions to reduce high post acute care utilization

rates, we must use these descriptive results to inform future research that can identify and modify the underlying, modifiable patient factors and system failures that increase risk of post acute care use.

Our finding of high rates of ED visits in the post-acute care period has important policy implications. As we move forward, there will be increasing participation in new payment and delivery models that directly and indirectly incentivize avoiding costly and avoidable acute care utilization.<sup>32–33</sup> Policies that incentivize reducing readmissions may result in unintended consequences. For example, patient care could shift to EDs and observation units where emergency physicians may be encouraged to avoid readmitting patients. Hence, ED utilization can be a useful, patient-centered metric to track as part of efforts to decrease hospital readmission. Even if readmission rates drop, high or increasing rates of ED use in the post-acute care period may reflect shortcomings in access to and delivery of care during the transition from hospital to home.

Our study should be viewed in the context of several limitations. Our data were derived from only three states, however, they were population-based and the states are large and geographically diverse. Moreover, in aggregate these states account for approximately 17% of hospitalizations in the United States. Second, because this study focused on hospital-based, acute care visits, we only measured acute care that occurred in the ED or inpatient hospital setting. Patients placed in observation status and visits to physician offices or other ambulatory care sites were not included. It is also possible that some patients visit urgent care centers or walk in clinics, as opposed to the ED, that are not captured in the HCUP databases, particularly in the state of California where Kaiser has a substantial presence. Hence, our results may actually underestimate the use of acute care after hospital discharge. Third, we were not able to identify those patients who died following hospitalization. Fourth, as with any large database analysis, inherent limitations related to the use of claims based administrative data has the potential for errors in recording diagnoses, and thus misclassification of encounters. While such errors are possible, Healthcare Cost and Utilization Project data are highly accurate, rigorously tested and widely used to estimate diagnoses and visit frequency.<sup>15,29–31</sup> Finally, we used diagnoses from administrative data as a proxy for the reason for return visit. Using the reason for visit may be a more accurate representation of why patients return; however, chief complaints or similar data are not available in HCUP data.

In conclusion, hospital-based, acute care encounters are frequent among patients recently discharged from an inpatient setting. An improved understanding of how the ED setting is best used in the management of acute care needs – particularly for patients recently discharged from the hospital – is an important component of the effort to improve care transitions. The use of hospital readmissions as a lone metric for post-discharge healthcare quality may be incomplete without considering the role of the ED. Just as the Patient Protection and Affordable Care Act requires the development of programs to reduce readmissions, further initiatives are necessary to understand the drivers of post discharge ED use and the clinical and financial efficiency associated with providing such acute care in the ED.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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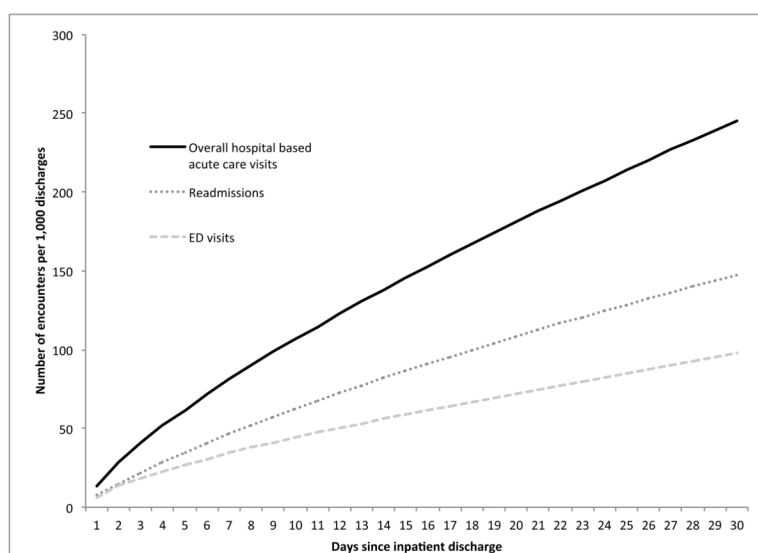
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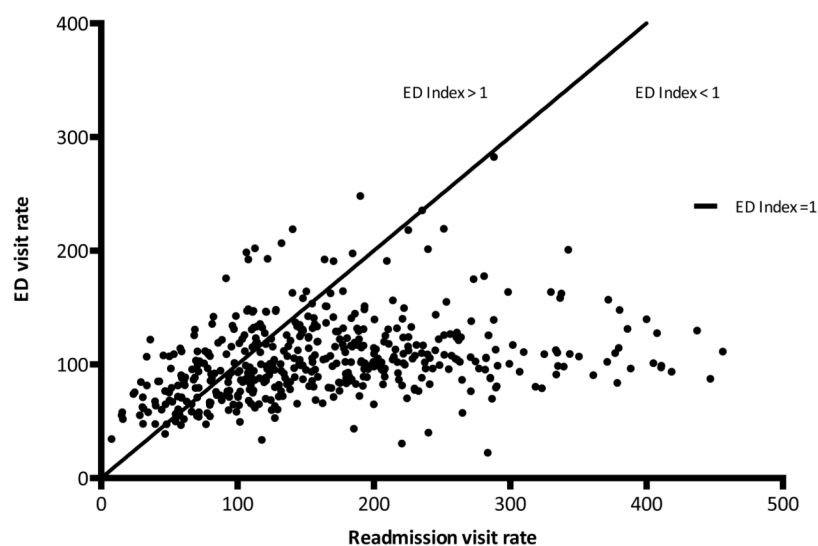
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**Figure 1. Hospital based, acute care utilization (Emergency Department use or Readmission) within 30 days of index hospital discharge**

Note: All discharges (5,032,254) were included in analysis.

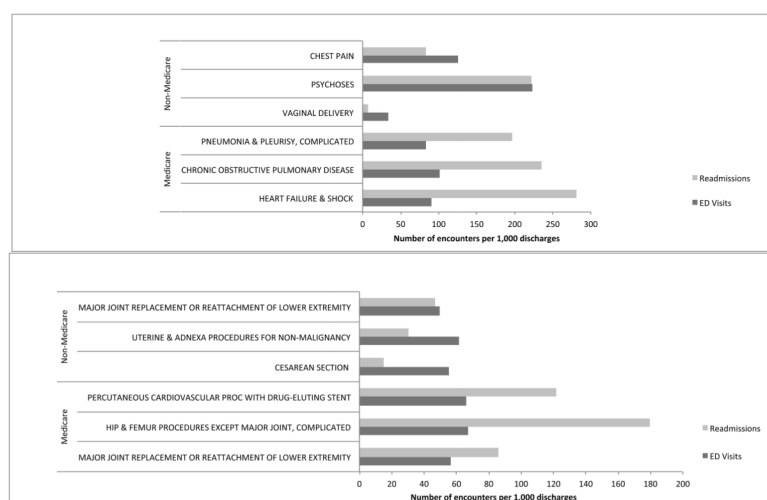
Abbreviations: ED, emergency department



**Figure 2. Hospital-based, acute care utilization (Emergency Department use or Readmission) within 30 days of index hospital discharge, according to Diagnostic Related Group**

Note: DRG specific ED utilization ranged from 22.4–282.5 visits/1,000 discharges, readmission rates from 7.6 (95% CI, 7.4–7.9)–875.7 (95% CI, 826.6–927.1)–readmissions/1,000 discharges. 8 data points are outside the limits of the x-axis. A line representing an ED index (ED visit rate/readmission rate) of 1 is provided for reference.

Abbreviations: ED, emergency department; DRG, diagnosis related group



**Figure 3. Hospital-based, acute care utilization (Emergency Department use or Readmission) within 30 days of index hospital discharge for common medical and surgical index hospital discharge conditions, according to insurance status**

Note: Analysis conducted for the three highest volume medical and surgical conditions for both groups. The number of discharges included in analysis for non-Medicare encounters were: chest pain (n=67,307), psychosis (n=120,423), vaginal delivery (n=406,441), major joint replacement or reattachment of lower extremity (n=61,618), uterine and adnexal procedures for non-malignancy (n=70,044), cesarean section (n=199,063). The number of discharges included in analysis for Medicare encounters were: pneumonia and pleurisy (n=62,305), chronic obstructive pulmonary disease (n=75,191), heart failure and shock (n=88,279), percutaneous cardiovascular procedure with drug-eluting stent (n=20,463), complicated hip and femur procedures except major joint (n=26,687) and major joint replacement or reattachment of lower extremity (61,618).

Abbreviations: ED, emergency department

Table 1

Initial-based, acute care utilization (Emergency Department use or Readmission) within 30 days of index hospital discharge, according to the highest discharge diagnoses

Index hospital discharge condition	Number of discharges	% of total discharges	ED visit rate*	95% Confidence Intervals	Readmission rate*	95% Confidence Intervals	Hospital-based, acute care rate*	95% Confidence Intervals	ED Index		
<b>Total</b>	3,279,320	65.2									
Maternal delivery	407,733	12.4	34.4	33.9	35.0	7.6	7.4	7.9	42.1	42.7	4.51
Fractures	181,492	5.5	219.4	217.2	221.5	251.4	249.1	253.8	470.8	474.0	0.87
Heart failure and shock	116,555	3.6	96.4	94.6	98.2	277.1	274.1	280.2	373.5	377.0	0.35
Joint pain	109,781	3.3	118.6	116.6	120.7	101.4	99.6	103.3	220.1	222.9	1.17
Chronic obstructive pulmonary disease	108,639	3.3	115.9	113.9	117.9	225.1	222.3	227.9	341.0	344.5	0.51
Asthma	91,244	2.8	92.8	90.8	94.8	181.2	178.4	184.0	274.0	277.4	0.51
Anemia	81,943	2.5	81.6	79.6	83.5	220.7	217.5	223.9	302.2	306.0	0.37
Gastritis, gastroenteritis and miscellaneous digestive disorders	81,646	2.5	140.7	138.1	143.3	183.5	180.6	186.4	324.1	328.1	0.77
Cerebral hemorrhage or cerebral infarction	71,519	2.2	83.8	81.7	85.9	175.4	172.4	178.5	259.2	262.9	0.48
Key and urinary tract infections, complicated	63,070	1.9	103.1	100.6	105.6	190.9	187.5	194.3	294.0	298.2	0.54
<b>Other medical discharges</b>	1,965,698	59.9	115.4	114.9	115.9	187.2	186.5	187.8	302.6	303.3	0.62
<b>Total</b>	1,752,934	34.8									
Craniotomy	199,880	11.4	55.4	54.4	56.4	15.0	14.4	15.5	70.4	71.5	3.70
Joint replacement or reattachment of extremity	166,850	9.5	54.0	52.9	55.2	71.6	70.3	72.9	125.6	127.3	0.76
Neurectomy and adrena procedure for non-malignancy	76,668	4.4	61.4	59.7	63.2	31.0	29.8	32.3	92.4	94.6	1.98
Craniotomy, complicated	56,696	3.2	84.6	82.2	87.0	29.2	27.8	30.6	113.7	116.5	2.90
Stent with drug-eluting stent	36,700	2.1	65.7	63.2	68.4	109.9	106.6	113.4	175.7	180.0	0.60
Cholecystectomy	34,951	2.0	75.3	72.5	78.3	49.9	47.6	52.3	125.3	129.0	1.51
Stent with drug-eluting stent, with major vascular diagnoses	34,142	1.9	81.0	78.0	84.0	152.6	148.5	156.8	233.6	238.8	0.53



ICD-9-CM hospital discharge condition	Number of discharges	% of total discharges	ED visit rate *	95% Confidence Intervals		Readmission rate *	95% Confidence Intervals		Hospital-based, acute care rate *	ED Index		
and femur procedures except major complicated	32,607	1.9	71.3	68.4	74.3	170.4	166.0	175.0	241.7	236.4	247.1	0.42
endoscopic cholecystectomy, complicated	31,683	1.8	84.5	81.3	87.8	103.9	100.4	107.5	188.4	183.6	193.2	0.81
endectomy	28,671	1.6	62.5	59.6	65.4	30.3	28.4	32.4	92.8	89.3	96.4	2.06
other surgical discharges	1,054,086	60.1	136.9	136.2	137.6	85.3	84.7	85.8	222.1	221.2	223.0	1.61

expressed as per 1,000 discharges; Abbreviations: ED, Emergency Department; PCI, Percutaneous Coronary Intervention

**Table 2**  
Discharge diagnoses associated with Emergency Department visits within 30 days of index hospital discharge

Index hospital discharge condition	Most common	2nd	3rd
<b>Medical</b>			
Vaginal delivery	Other complications of birth; puerperium affecting management of mother	Other complications of pregnancy	Urinary tract infections
Psychoses	Schizophrenia and other psychotic disorders	Mood disorders	Anxiety disorders
Heart failure and shock	Congestive heart failure; non-hypertensive	Nonspecific chest pain	Nonspecific chest pain
Chest pain	Nonspecific chest pain	Abdominal pain	Spondylosis; intervertebral disc disorders; other back problems
Chronic obstructive pulmonary disease	Chronic obstructive pulmonary disease	Nonspecific chest pain	Asthma
Pneumonia	Other lower respiratory disease	Pneumonia	Chronic obstructive pulmonary disease
Septicemia	Urinary tract infection	Genitourinary symptoms	Abdominal pain
Esophagitis, gastroenteritis and miscellaneous digestive disorders	Abdominal pain	Nausea and vomiting	Nonspecific chest pain
Intracranial hemorrhage or cerebral infarction	Headache	Essential hypertension	Acute cerebrovascular disease
Kidney and urinary tract infections, complicated	Urinary tract infection	Abdominal pain	Genitourinary symptoms
All other medical discharges	Abdominal pain	Nonspecific chest pain	Superficial injury; contusion
<b>Surgical</b>			
Cesarean section	Other complications of birth; puerperium affecting management of mother	Other complications of pregnancy	Abdominal pain
Major joint replacement or reattachment of lower extremity	Other non-traumatic joint disorders	Other connective tissue disorders	Complications of surgical procedures or medical care
Uterine and adnexa procedure for non-malignancy	Complications of surgical procedures or medical care	Abdominal pain	Other female genital disorders
Cesarean section, complicated	Other complications of birth; puerperium affecting management of mother	Other complications of pregnancy	Other aftercare
PCI with drug-eluting stent	Nonspecific chest pain	Coronary atherosclerosis and other heart disease	Abdominal pain
Laparoscopic cholecystectomy	Abdominal pain	Other nervous system disorders	Complications of surgical procedures or medical care
PCI with drug-eluting stent, with major cardiovascular diagnoses	Nonspecific chest pain	Coronary atherosclerosis and other heart disease	Complications of surgical procedures or medical care
Hip and femur procedures except major joint, complicated	Other non-traumatic joint disorders	Superficial injury; contusion	Other connective tissue disease

Index hospital discharge condition	Most common	2nd	3rd
Laparoscopic cholecystectomy, complicated	Abdominal pain	Complications of surgical procedures or medical care	Other aftercare
Appendectomy	Abdominal pain	Complications of surgical procedures or medical care	Other aftercare
All other surgical discharges	Complications of surgical procedures or medical care	Abdominal pain	Other aftercare

Abbreviations: PCI, percutaneous coronary intervention