



# Which Medicare Patients Are Transferred from Rural Emergency Departments?

Michelle Casey MS, Jeffrey McCullough PhD, and Robert Kreiger PhD

## Key Findings

- Among Medicare beneficiaries who received same-day emergency care and inpatient care in 2010, the inpatient stay was in a different hospital for 28.4% of the Critical Access Hospital (CAH) emergency encounters, compared to 9.0% for rural non-CAHs and 2.0% for urban hospitals.
- The top diagnoses for Medicare same-day emergency care in a CAH and inpatient care at another hospital were chest pain (8.7% of encounters), hip fracture (6.1%), acute myocardial infarction (AMI) (5.8%), dysrhythmia (4.8%), coronary atherosclerosis and other heart disease (4.2%), acute cerebrovascular disease (4.2%), and congestive heart failure (CHF) (4.1%).
- The top diagnoses for Medicare patients who received same-day emergency care in a rural non-CAH and inpatient care in a different hospital were chest pain (8.6%), AMI (8.5%), acute cerebrovascular disease (6.9%), coronary atherosclerosis and other heart disease (5.2%), hip fracture (3.8%), and dysrhythmia (3.8%).
- The majority of transferred CAH and rural non-CAH emergency patients went to urban hospitals for inpatient care. By diagnosis, most transferred patients with intracranial injuries and cardiac-related diagnoses went to urban hospitals, while 35%-45% of CAH and rural non-CAH patients with certain mental health diagnoses were transferred to other CAHs or rural non-CAHs.

## Background

Rural hospitals provide first-line treatment for emergency patients and inpatient care for less-complex patients. They also play a crucial role in stabilizing patients and coordinating transfers to tertiary care for patients who need a higher level of care. Studies have found that rural hospitals, especially CAHs, are more likely to transfer patients than larger hospitals. Using inpatient claims data, researchers have analyzed patients “received in transfer” from rural hospitals, including intensive care unit (ICU) patients in Iowa,<sup>1</sup> a national sample of patients with traumatic injuries,<sup>2</sup> and Medicare patients with AMI in five states.<sup>3</sup>

Patient transfers from emergency departments (EDs) to other hospitals are more difficult to study than inpatient transfers between hospitals, since data must be linked across the hospital outpatient and inpatient databases to identify claims for these episodes of care. Consequently, little is known about patients who are transferred from rural EDs to other hospitals.

The limited literature on patient transfers from rural EDs to other hospitals suggests that they may account for a substantial portion of transfers for some serious medical conditions. In a study of 1,861 patients with acute cardiac symptoms treated in ten rural Colorado hospitals, 8% of patients were transferred directly from the ED to another hospital, and another 10% were transferred after inpatient admission.<sup>4</sup> Among patients who were diagnosed with AMI, 22% were transferred directly from the ED to another hospital.<sup>4</sup>

## Purpose

The purpose of this study is to analyze transfers of Medicare beneficiaries who received emergency care in a CAH or rural hospital and were transferred to another hospital for care. This policy brief addresses the following research questions:

- Which rural Medicare patients are being transferred from CAH/ rural hospital EDs to other hospitals? How many of these patients have a primary diagnosis of AMI, heart failure, pneumonia, stroke, or chronic obstructive pulmonary disease? What other primary diagnoses are common for these patients?
- How do Medicare patients who are transferred from rural EDs to

larger hospitals differ from patients who are admitted as inpatients to the same rural hospital in terms of diagnoses?

- Does the type of hospital (CAH, other rural, or urban) to which rural Medicare patients are transferred vary by diagnosis?

### Approach

This study used several databases. Data on hospital type and location came from a CAH database maintained by the Flex Monitoring Team ([www.flexmonitoring.org](http://www.flexmonitoring.org)) and from the 2010 Centers for Medicare and Medicaid Services (CMS) Provider of Service file. The 100% MedPAR file generally includes claims for Medicare beneficiaries who received inpatient care at CAHs as well as those who received both inpatient and emergency care at the same Prospective Payment System (PPS) hospital. The 100% Hospital Outpatient Standard Analytical File generally includes emergency claims for Medicare beneficiaries who received emergency care in a PPS hospital but did not receive inpatient care in the same hospital, as well as emergency claims for beneficiaries who received emergency care in a CAH, regardless of whether they received inpatient care in the same hospital or not. (Differences between CAHs and PPS hospitals reflect the fact that CAHs are not subject to the 3-day payment window policy, which requires PPS hospitals to include in an inpatient claim the charges for Medicare outpatient services that occur within 3 days prior to an inpatient hospitalization.)<sup>5</sup>

Two types of encounters were identified and analyzed. First, we identified all emergency encounters with a same-day inpatient admission to the same hospital using encrypted patient identifiers, provider numbers, and dates of service. These encounters included: (1) MedPAR records with an ED charge amount greater than zero, and (2) MedPAR records with an ED charge equal to zero linked to an outpatient record with an ED revenue code, the same beneficiary identifier, same provider number, and a claim through date equal to the inpatient admit date in the MedPAR record. Second, we identified all emergency encounters with a same-day inpatient admission to a different hospital using a similar process as (2) above except that the ED and inpatient encounters had different provider numbers. We chose this method of identifying transfers between hospitals, rather than relying on discharge status codes in the emergency claims, since a significant number of claims had missing or unreliable data for this variable.

The Medicare claims records do not include time of service. Consequently,

ly, it was not possible to determine the order of emergency and inpatient care received on the same date. For purposes of this analysis, we assumed that the emergency care preceded the inpatient care in sequence for both sets of claims. About 99.8% of the linked records with same-day emergency care and inpatient care at different hospitals included only one emergency claim and one inpatient claim.<sup>i</sup>

ICD-9 codes for primary diagnoses were grouped using the Clinical Classifications Software (CCS) tool developed by the Agency for Healthcare Research and Quality (AHRQ) for clustering patient diagnoses and procedures into a manageable number of clinically meaningful categories.<sup>6</sup>

Each set of encounters was first categorized by the type of hospital (CAH, rural non-CAH, urban) and the CCS diagnosis code for the emergency care encounter. Next, emergency encounters with an inpatient stay in a different hospital were further categorized by the location of the inpatient encounter: a CAH, a non-CAH rural hospital, or an urban hospital.

**Table 1. Medicare encounters for same-day emergency and inpatient care in the same and different hospitals in 2010 by hospital type**

Emergency encounter location	Same-day inpatient encounters				
	Total	Same hospital as emergency encounter		Different hospital than emergency encounter	
CAHs	380,492	272,552	71.6%	107,940	28.4%
Rural non-CAHs	1,293,946	1,177,206	91.0%	116,740	9.0%
Urban hospitals	8,269,158	8,100,481	98.0%	168,677	2.0%

Data Sources: 2010 Medicare Hospital Outpatient Standard Analytic File and MedPAR.

<sup>i</sup> For the very small number of linked records with multiple same-day ED claims for the same beneficiary (0.2% of the total), the ED claim with more diagnoses was selected to analyze with the inpatient claim.

**Results**

*Same-Day Emergency and Inpatient Care by Hospital Type*

Table 1 shows the total number of Medicare emergency encounters with a same-day inpatient encounter in 2010 for CAHs, rural non-CAHs and urban hospitals, and the share of encounters where the inpatient stay was in the same hospital or a different hospital. For CAHs, the inpatient stay was in a different hospital than the emergency care for 28.4% of encounters, compared to only 9.0% for rural non-CAHs and 2.0% for urban hospitals.

*Top Diagnoses for Same-Day Emergency and Inpatient Care in the Same Hospital*

For Medicare beneficiaries who received same-day emergency and inpatient care in the same hospital in 2010, Table 2 shows the top ten emergency care diagnoses for each of the three hospital types (CAHs, rural non-CAHs and urban hospitals). In CAHs, the top ten diagnoses account for a higher percent of claims (49.8%) than the top ten diagnoses in rural non-CAHs (43.6%) and the top ten diagnoses in urban hospitals (37.9%).

Although there is considerable overlap among the top diagnoses by hospital type, some different patterns emerge. Pneumonia is the top diagnosis in both CAHs (12.5% of encounters) and rural non-CAH hospitals (7.5%). The next most common diagnoses for CAHs and rural non-CAHs are congestive heart failure (CHF) (7.3% in CAHs and 6.5% in rural non-CAHs) and chronic obstructive pulmonary disease (COPD) (7.1% in CAHs and 6.0% in rural non-CAHs). In urban hospitals, CHF is the top diagnosis (5.9% of claims), followed by septicemia (5.5%) and then pneumonia (4.8%).

**Table 2. Top diagnoses for Medicare beneficiaries who received same-day emergency and inpatient care in the same hospital in 2010**

	Rank, Number and Percent of Encounters								
	CAHs			Rural non-CAHs			Urban hospitals		
<b>Total Encounters</b>	272,552			1,177,206			8,100,481		
<b>CCS Diagnosis Group<sup>1</sup></b>	Rank	No.	% <sup>2</sup>	Rank	No.	% <sup>3</sup>	Rank	No.	% <sup>4</sup>
<b>Pneumonia</b>	1	33,966	12.5	1	88,226	7.5	3	390,346	4.8
<b>Congestive Heart Failure (CHF)</b>	2	19,824	7.3	2	76,298	6.5	1	476,575	5.9
<b>Chronic Obstructive Pulmonary Disease (COPD)</b>	3	19,216	7.1	3	70,471	6.0	5	306,010	3.8
<b>Urinary Tract Infection (UTI)</b>	4	15,819	5.8	6	44,278	3.8	6	267,174	3.3
<b>Fluid and electrolyte disorders</b>	5	10,871	4.0	8	31,499	2.7	11	181,361	2.2
<b>Dysrhythmia</b>	6	9,067	3.3	5	44,769	3.8	4	306,797	3.8
<b>Acute cerebrovascular disease</b>	7	7,591	2.8	7	33,491	2.8	7	263,430	3.3
<b>Septicemia</b>	8	7,188	2.6	4	64,035	5.4	2	448,990	5.5
<b>Intestinal obstruction</b>	9	6,208	2.3	16	22,517	1.9	19	135,490	1.7
<b>Skin infection</b>	10	5,665	2.1	17	20,281	1.7	17	145,058	1.8
<b>Chest pain</b>	12	5,490	2.0	11	25,383	2.2	10	191,819	2.4
<b>Acute Myocardial Infarction (AMI)</b>	13	4,457	1.6	9	30,230	2.6	8	218,866	2.7
<b>Acute renal failure</b>	21	3,153	1.2	14	23,778	2.0	9	194,719	2.4
<b>Fracture of hip</b>	14	4,159	1.5	10	28,850	2.5	12	181,069	2.2

1. Based on first-listed diagnosis for encounters with an ED revenue code, grouped by Clinical Classification Software (CCS) category.
2. Percent of all CAH emergency encounters with an inpatient admission to the same hospital.
3. Percent of all rural non-CAH emergency encounters with an inpatient admission to the same hospital.
4. Percent of all urban hospital emergency encounters with an inpatient admission to the same hospital.

Data Sources: 2010 Medicare Hospital Outpatient Standard Analytic File and MedPAR.

## Which Medicare Patients Are Transferred From Rural Emergency Departments?

### *Top Diagnoses for Same-Day Emergency and Inpatient Care in Different Hospitals*

For Medicare beneficiaries who received same-day emergency and inpatient care in different hospitals, Table 3 includes the top ten diagnoses for each of the three hospital types. The top ten diagnoses in each hospital type account for 48.1% of encounters in CAHs, 47.3% in rural non-CAHs, and 43.1% in urban hospitals.

The top diagnoses overlap by hospital type, but there are some differences as well. Cardiac-related diagnoses account for several of the top diagnoses in all three types of hospitals.

Chest pain is the top diagnosis in both CAHs (8.7% of claims) and rural non-CAHs (8.6%); it ranks 2<sup>nd</sup> among urban hospitals (6.1%). AMI is also a top diagnosis, ranking 2<sup>nd</sup> in rural hospitals (8.5%), 3<sup>rd</sup> in CAHs (5.8%), and 5<sup>th</sup> in urban hospitals (4.8%). Dysrhythmia is 4<sup>th</sup> in CAHs (4.8%), 6<sup>th</sup> in rural non-CAHs (3.8%), and 9<sup>th</sup> in urban hospitals (2.5%).

Acute cerebrovascular disease is the top diagnosis in urban hospitals (8.1%), and ranks 3<sup>rd</sup> and 6<sup>th</sup> respectively in rural non-CAHs (6.9%) and CAHs (4.2%). Hip fracture ranks 2<sup>nd</sup> in CAHs (6.1%) and 5<sup>th</sup> in rural non-

CAHs (3.8%), but is 14<sup>th</sup> in urban hospitals (2.1%).

Mental-health related diagnoses rank highly in urban hospitals. Mood disorders and schizophrenia/other psychotic disorders are tied for 3<sup>rd</sup> in urban hospitals, accounting for 5.3% each of diagnoses, compared to 1.8-1.9% of diagnoses in rural non-CAHs and 0.9-1.0% of diagnoses in CAHs.

### *Top Diagnoses for Same-Day CAH Emergency Care and Inpatient Care at Other Hospitals by Hospital Type*

Table 4 (page 6) shows the total number of encounters with same-day

**Table 3. Top diagnoses for Medicare beneficiaries who received same-day emergency and inpatient care in different hospitals in 2010**

	Rank, Number and Percent of Encounters								
	CAHs			Rural Non-CAHs			Urban Hospitals		
<b>Total Encounters</b>	107,940			116,740			168,677		
<b>CCS Diagnosis Group<sup>1</sup></b>	Rank	No.	% <sup>2</sup>	Rank	No.	% <sup>3</sup>	Rank	No.	% <sup>4</sup>
<b>Chest pain</b>	1	9,339	8.7	1	9,951	8.6	2	10,214	6.1
<b>Hip fracture</b>	2	6,551	6.1	5	4,442	3.8	14	3,582	2.1
<b>Acute myocardial infarction (AMI)</b>	3	6,225	5.8	2	9,823	8.5	5	8,170	4.8
<b>Dysrhythmia</b>	4	5,201	4.8	6	4,358	3.8	9	4,165	2.5
<b>Coronary atherosclerosis &amp; other heart disease</b>	5	4,570	4.2	4	6,029	5.2	7	4,521	2.7
<b>Acute cerebrovascular disease</b>	6	4,543	4.2	3	7,946	6.9	1	13,662	8.1
<b>Congestive heart failure (CHF)</b>	7	4,453	4.1	7	3,891	3.4	11	3,739	2.2
<b>Pneumonia</b>	8	3,821	3.5	10	2,803	2.4	13	3,594	2.1
<b>Gastrointestinal hemorrhage</b>	9	3,613	3.4	9	2,972	2.6	17	2,721	1.6
<b>Other lower respiratory disease</b>	10	3,561	3.3	8	3,007	2.6	12	3,614	2.1
<b>Schizophrenia &amp; other psychotic disorders</b>	24	1,085	1.0	14	2,149	1.9	3	8,937	5.3
<b>Mood disorders</b>	25	1,008	0.9	15	2,102	1.8	3	8,937	5.3

1. Based on first-listed diagnosis for claims with an ED revenue code, grouped by Clinical Classification Software (CCS) category.
2. Percent of all CAH emergency claims with an inpatient admission to a different hospital.
3. Percent of all rural non-CAH emergency claims with an inpatient admission to a different hospital.
4. Percent of all urban hospital emergency claims with an inpatient admission to a different hospital.

Data Sources: 2010 Medicare Hospital Outpatient Standard Analytic File and MedPAR.

CAH emergency care and inpatient hospitalization in a different hospital, and the number and percent of encounters for the top 25 diagnoses by location of the inpatient hospitalization: another CAH, a rural non-CAH, or an urban hospital.

Of the total 107,940 same-day CAH emergency encounters with an inpatient hospitalization in a different hospital, 78.5% of the inpatient hospitalizations were in an urban hospital, 20.3% were in a rural non-CAH and 1.2% were in another CAH. The percent of inpatient hospitalizations in urban hospitals, rural non-CAHs, and other CAHs varied by diagnosis. For example, among CAH ED encounters with a primary diagnosis of chest pain and same-day inpatient care in a different hospital, 83.1% of inpatient hospitalizations were in an urban hospital, 16.6% were in a rural non-CAH, and 0.3% were in another CAH.

Among the top 25 diagnoses, the percentages of CAH ED encounters with same-day inpatient care in an urban hospital are highest for intracranial injuries (91.9%), acute cerebrovascular disease (86.9%), coronary atherosclerosis and other heart disease (85.1%), and AMI and other fractures (84.9% each). The percentages of CAH ED encounters with same-day inpatient care in a rural non-CAH are highest for mood disorders (34.4%), hip fracture (31.9%), and schizophrenia/other psychotic disorders (30.4%).

Mood disorders and schizophrenia/other psychotic disorders also have the highest percentages of same-day inpatient care in another CAH (4.3% and 5.0% respectively).

### *Top Diagnoses for Same-Day Rural Non-CAH Emergency Care and Inpatient Care at Other Hospitals by Hospital Type*

Table 5 (page 7) shows the total number of encounters for same-day emergency care in a rural non-CAH and inpatient hospitalization in a different hospital for the top 25 diagnoses. It also shows the number and percent of encounters by location of the inpatient hospitalization: a CAH, another rural non-CAH, or an urban hospital.

Of the total 115,740 same-day rural non-CAH emergency encounters with an inpatient hospitalization in a different hospital, 83.5% of the inpatient hospitalizations were in an urban hospital, 15.7% were in another rural non-CAH, and 0.7% were in a CAH. The pattern of top diagnoses for rural non-CAHs is similar to CAHs. Among the top 25 diagnoses, the percentage of rural non-CAH emergency patients whose same-day inpatient care was in an urban hospital are highest for acute cerebrovascular disease (92%), intracranial injuries (91.6%), complication of device, implant, or graft (89.4%), and coronary atherosclerosis/other heart disease and other fractures (89.2% each). Schizophrenia/other psychotic

disorders and mood disorders have the highest percentages of same-day inpatient care in another rural non-CAH (36.2% and 40% respectively).

### *Top Diagnoses for Same-Day Urban Emergency Care and Inpatient Care at Other Hospitals by Hospital Type*

Table 6 (page 8) shows the total number of encounters for same-day emergency care in an urban hospital and inpatient hospitalization in a different hospital for the top 25 diagnoses. It also shows the number and percent of encounters by location of the inpatient hospitalization: a CAH, a rural non-CAH or another urban hospital.

Of the total 168,677 same-day urban emergency encounters with an inpatient hospitalization in a different hospital, 97.9% of the inpatient hospitalizations were in another urban hospital, 1.8% were in a rural non-CAH, and 0.3% were in a CAH. The inpatient hospital type did not vary much by diagnosis, with more than 90% of linked inpatient hospitalizations in another urban hospital. The lowest rates were for suicide and intentional self-inflicted injury (93.6%); schizophrenia/other psychotic disorders (94.5%), and mood disorders (94.6%).

*Article text (Policy Implications and References) resumes on page 9, following Tables 4, 5, and 6 (pages 6, 7, and 8, respectively).*

**Table 4. Top 25 diagnoses for Medicare beneficiaries who received same-day emergency care in a CAH and inpatient hospitalization in a different hospital by hospital type**

		Total	Location of inpatient hospitalization					
			Another CAH		Rural non-CAH		Urban hospital	
			No.	%	No.	%	No.	%
	<b>All Encounters</b>	107,940	1288	1.2	21,950	20.3	84,702	78.5
<b>Rank</b>	<b>CCS Diagnosis Groups<sup>1</sup></b>							
1	Chest pain	9339	31	0.3	1546	16.6	7762	83.1
2	Hip fracture	6551	197	3.0	2093	31.9	4261	65.0
3	Acute myocardial infarction (AMI)	6225	*	*	935	15.0	5283	84.9
4	Dysrhythmia	5201	14	0.3	985	18.9	4202	80.8
5	Coronary atherosclerosis & other heart disease	4570	*	*	680	14.9	3887	85.1
6	Acute cerebrovascular disease	4543	17	0.4	577	12.7	3949	86.9
7	Congestive heart failure (CHF)	4453	29	0.7	840	18.9	3584	80.5
8	Pneumonia	3821	71	1.9	921	24.1	2829	74.0
9	Gastrointestinal hemorrhage	3613	41	1.1	775	21.5	2797	77.4
10	Other lower respiratory disease	3561	28	0.8	716	20.1	2817	79.1
11	Abdominal pain	2872	42	1.5	682	23.7	2148	74.8
12	Chronic obstructive pulmonary disease (COPD)	2074	41	2.0	556	26.8	1477	71.2
13	Unclassified	2051	22	1.1	389	19.0	1640	80.0
14	Syncope	2032	21	1.0	370	18.2	1641	80.8
15	Fracture leg	1953	46	2.4	582	29.8	1325	67.8
16	Intestinal obstruction	1802	17	0.9	398	22.1	1387	77.0
17	Adult respiratory failure	1760	*	*	298	16.9	1454	82.6
18	Fluid/electrolyte disorder	1542	28	1.8	338	21.9	1176	76.3
19	Acute renal failure	1438	*	*	281	19.5	1153	80.2
20	Intracranial injuries	1265	*	*	101	8.0	1163	91.9
21	Septicemia	1171	*	*	241	20.6	923	78.8
22	Urinary tract infection (UTI)	1159	23	2.0	305	26.3	831	71.7
23	Other fracture	1156	13	1.1	162	14.0	981	84.9
24	Schizophrenia & other psychotic disorders	1085	54	5.0	330	30.4	701	64.6
25	Mood disorders	1008	43	4.3	347	34.4	618	61.3

1. Top 25 diagnoses, based on first-listed diagnosis for encounters with an ED revenue code, grouped by Clinical Classification Software (CSS) category.

\* Less than 10 encounters; data suppressed per CMS data suppression policy.

Data Sources: 2010 Medicare Hospital Outpatient Standard Analytic File and MedPAR.

**Table 5. Top 25 diagnoses for Medicare beneficiaries who received same-day emergency care in a rural non-CAH and inpatient hospitalization in a different hospital by hospital type**

		Total	Location of inpatient hospitalization					
			CAH		Another rural non-CAH		Urban hospital	
			No.	%	No.	%	No.	%
	<b>All encounters</b>	115,740	858	0.7	18,229	15.7	96,653	83.5
<b>Rank</b>	<b>CCS Diagnosis Groups<sup>1</sup></b>							
1	Chest pain	9,951	15	0.2	1,339	13.5	8,597	86.4
2	Acute myocardial infarction (AMI)	9,823	*	*	1,288	13.1	8,530	86.8
3	Acute cerebrovascular disease	7,946	*	*	627	7.9	7,311	92.0
4	Coronary atherosclerosis & other heart disease	6,029	*	*	648	10.7	5,377	89.2
5	Hip fracture	4,442	24	0.5	1,188	26.7	3,230	72.7
6	Dysrhythmia	4,358	*	*	545	12.5	3,804	87.3
7	Congestive heart failure (CHF)	3,891	*	*	592	15.2	3,291	84.6
8	Other lower respiratory disease	3,007	12	0.4	478	15.9	2,517	83.7
9	Gastrointestinal hemorrhage	2,972	*	*	410	13.8	2,556	86.0
10	Pneumonia	2,803	39	1.4	482	17.2	2,282	81.4
11	Intracranial injuries	2,778	*	*	233	8.4	2,544	91.6
12	Unclassified	2,329	29	1.2	452	19.4	1,848	79.3
13	Abdominal pain	2,154	20	0.9	290	13.5	1,844	85.6
14	Schizophrenia & other psychotic disorders	2,149	109	5.1	777	36.2	1,263	58.8
15	Mood disorders	2,102	99	4.7	841	40.0	1,162	55.3
16	Syncope	1,860	*	*	286	15.4	1,568	84.3
17	Other fracture	1,826	*	*	192	10.5	1,628	89.2
18	Fracture leg	1,710	11	0.6	358	20.9	1,341	83.6
19	Acute renal failure	1,604	*	*	240	15.0	1,361	79.6
20	Adult respiratory failure	1,540	*	*	203	13.2	1,337	86.8
21	Chronic obstructive pulmonary disease (COPD)	1,353	17	1.3	295	21.8	1,041	76.9
22	Fluid/electrolyte disorder	1,290	14	1.1	238	18.4	1,038	80.5
23	Septicemia	1,266	*	*	177	14.0	1,084	85.6
24	Intestinal obstruction	1,239	*	*	203	16.4	1,029	83.1
25	Complication of device, implant or graft	1,080	*	*	111	10.3	965	89.4

1. Top 25 diagnoses, based on first-listed diagnosis for encounters with an ED revenue code, grouped by Clinical Classification Software (CSS) category.

\* Less than 10 encounters; data suppressed per CMS data suppression policy.

Data Sources: 2010 Medicare Hospital Outpatient Standard Analytic File and MedPAR.

**Table 6. Top 25 diagnoses for Medicare beneficiaries who received same-day emergency care in an urban hospital and inpatient hospitalization in a different hospital by hospital type**

		Total	Location of inpatient hospitalization					
			CAH		Rural non-CAH		Another urban hospital	
			No.	%	No.	%	No.	%
	<b>All Encounters</b>	168,677	518	0.3	3030	1.8	165,129	97.9
<b>Rank</b>	<b>CCS Diagnosis Groups<sup>1</sup></b>							
1	Acute cerebrovascular disease	13,662	*	*	54	0.4	13,602	99.6
2	Chest pain	10,214	*	*	93	0.9	10,111	99.0
3	Mood disorders	8,937	49	0.5	437	4.9	8,451	94.6
4	Schizophrenia and other psychotic disorders	8,937	66	0.7	428	4.8	8,443	94.5
5	Acute myocardial infarction (AMI)	8,170	*	*	55	0.7	8,114	99.3
6	Intracranial injuries	6,128	*	*	33	0.5	6,093	99.4
7	Coronary atherosclerosis & other heart disease	4,521	*	*	25	0.6	4,496	99.4
8	Unclassified	4,211	*	*	37	0.9	4,125	98.0
9	Dysrhythmia	4,165	23	0.6	105	2.5	4,083	98.0
10	Abdominal pain	3,822	15	0.4	74	1.9	3,733	97.7
11	Congestive heart failure (CHF)	3,739	*	*	34	0.9	3,703	99.0
12	Other lower respiratory	3,614	*	*	72	2.0	3,532	97.7
13	Pneumonia	3,594	11	0.3	56	1.6	3,527	98.1
14	Fracture hip	3,582	*	*	59	1.6	3,514	98.1
15	Other fracture	3,361	*	*	26	0.8	3,329	99.0
16	Syncope	3,006	*	*	31	1.0	2,972	98.9
17	Gastrointestinal hemorrhage	2,721	*	*	53	1.9	2,662	97.8
18	Suicide and intentional self-inflicted injury	2,035	*	*	123	6.0	1,904	93.6
19	Fracture leg	1,946	*	*	33	1.7	1,908	98.0
20	Other nervous disorders	1,886	*	*	27	1.4	1,853	98.3
21	Urinary tract infection (UTI)	1,855	12	0.6	42	2.3	1,801	97.1
22	Fluid/electrolytic disorder	1,750	*	*	24	1.4	1,718	98.2
23	Chronic obstructive pulmonary disease (COPD)	1,687	*	*	29	1.7	1,649	97.7
24	Other injury	1,682	12	0.7	24	1.4	1,646	97.9
25	Complication of device, implant or graft	1,668	*	*	23	1.4	1,644	98.6

1. Top 25 diagnoses, based on first-listed diagnosis for encounters with an ED revenue code, grouped by Clinical Classification Software (CCS) category.

\* Less than 10 encounters; data suppressed per CMS data suppression policy.

Data Sources: 2010 Medicare Hospital Outpatient Standard Analytic File and MedPAR.

### Policy Implications

Health care reform and the increased use of quality measures in public reporting and payment have intensified the importance of ensuring that rural hospital quality is measured appropriately, using relevant quality measures. Care coordination is an important priority for national, state and local efforts to improve the quality of health care.<sup>7</sup> Development and implementation of quality measures that address care coordination across health care settings is especially challenging when emergency department care is involved.<sup>8</sup>

Many quality measures exclude transferred patients because of difficulty assigning responsibility for the provision of recommended care and outcomes, while other measures assign responsibility either to the initial hospital or the receiving hospital. The inclusion or exclusion of transferred patients has a greater potential impact on quality measurement in CAHs and rural non-CAHs, because of their lower overall volumes of patients and greater likelihood of transferring patients than larger urban hospitals.

The results of this study are an important first step in understanding which Medicare patients are treated in rural EDs and transferred to other hospitals, and similarities and differences in diagnoses between CAHs, rural non-CAHs, and urban hospitals. The

analysis underscored the importance of considering patient transfers in CAH quality measurement and quality improvement initiatives, given that 28.4% of the CAH linked emergency and inpatient encounters had an inpatient stay in a different hospital, compared to 9.0% for rural non-CAHs and 2.1% for urban hospitals.

For CAHs and rural non-CAHs, cardiac-related diagnoses (e.g., chest pain, AMI, dysrhythmia, coronary atherosclerosis and other heart disease, and congestive heart failure), hip fracture, and acute cerebrovascular disease account for several of the top diagnoses for Medicare patients who receive same-day emergency and inpatient care in a different hospital. The majority of transferred CAH and rural non-CAH emergency patients receive inpatient care in an urban hospital, but the percent varies by diagnosis. Most transferred CAH and rural non-CAH patients with intracranial injuries and cardiac-related diagnoses went to urban hospitals, while 35%-45% of patients with certain mental health diagnoses and 27%-34.9% of those with hip fractures were transferred to other CAHs or rural-non CAHs for inpatient care.

Future work will further examine Medicare patient transfers from CAHs and rural non-CAHs and explore the relationship between transfers and mortality rates. ■

### References

1. Wakefield DS, Ward M, Miller T et al. Intensive Care Unit Utilization and Interhospital Transfers As Potential Indicators of Rural Hospital Quality. *J Rural Health* 2004; 20(4):394-400.
2. Bowman SM, Zimmerman FJ, Sharar SR et al. Rural Trauma: Is Trauma Designation Associated with Better Hospital Outcomes? *J Rural Health* 2008; 24(3):263-268.
3. Muus K, Knudson A, Klug M, Wynne J. In-Hospital Mortality among Rural Medicare Patients with Acute Myocardial Infarction: The Influence of Demographics, Transfer and Health Factors. *J Rural Health* 2011; 27(4):394-400.
4. Westfall JM, VanVorst RF, McGloin J, Selker HP. Triage and Diagnosis of Chest Pain in Rural Hospitals: Implementation of the ACI-TIPI in the High Plains Research Network. *Ann Fam Med* 2006; 4(2):153-158.
5. Centers for Medicare and Medicaid Services. Implementation of New Statutory Provision pertaining to Medicare 3-Day (1-Day) Payment Window Policy - Outpatient Services Treated As Inpatient. Available at: <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcutelInpatientPPS/ThreeDayPaymentWindow.html>
6. See <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccsfactsheet.jsp> for more information about CCS.
7. U.S. Department of Health and Human Services. National Strategy for Quality Improvement in Health Care: Report to Congress. March 2011.
8. Schuur JD, Hsia RY, Burstin H, Schull MJ, Pines JM. Quality Measurement in the Emergency Department: Past and Future. *Health Affairs* 2013; 32(12): 2129-2138.

**R H R C**

**Rural Health Research  
& Policy Centers**

Funded by the Federal Office of Rural Health Policy  
[www.ruralhealthresearch.org](http://www.ruralhealthresearch.org)

Support for this study was provided by the Office of Rural Health Policy, Health Resources and Services Administration, PHS Grant No. 5U1CRH03717. For more information, contact Michelle Casey (612.623.8316, [mcasey@umn.edu](mailto:mcasey@umn.edu))

University of Minnesota Rural Health Research Center  
Division of Health Policy and Management, School of Public Health, 2520 University Avenue SE, #201  
Minneapolis, Minnesota 55414