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Giving EMS Flexibility In Transporting Low-Acuity Patients Could Generate Substantial Medicare Savings

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ABSTRACT Some Medicare beneficiaries who place 911 calls to request an ambulance might safely be cared for in settings other than the emergency department (ED) at lower cost. Using 2005–09 Medicare claims data and a validated algorithm, we estimated that 12.9–16.2 percent of Medicare-covered 911 emergency medical services (EMS) transports involved conditions that were probably nonemergent or primary care treatable. Among beneficiaries not admitted to the hospital, about 34.5 percent had a low-acuity diagnosis that might have been managed outside the ED. Annual Medicare EMS and ED payments for these patients were approximately \$1 billion per year. If Medicare had the flexibility to reimburse EMS for managing selected 911 calls in ways other than transport to an ED, we estimate that the federal government could save \$283–\$560 million or more per year, while improving the continuity of patient care. If private insurance companies followed suit, overall societal savings could be twice as large.

Emergency medical services (EMS) systems in the United States transported twenty-one million adults and children to hospital emergency departments (EDs) in 2010 as a result of calls to 911.¹ EMS care is primarily oriented toward people who have life-threatening illnesses or injuries.² However, EMS providers regularly encounter patients whose complaints might be better managed in settings outside the ED.

Under the current statutory guidance for the reimbursement policies of the Centers for Medicare and Medicaid Services (CMS)—policies that are generally followed by private insurance plans—EMS units are strongly incentivized to transport 911 callers to a hospital ED to receive reimbursement.³ This discourages EMS agencies from developing alternative approaches to managing 911 callers with less-serious problems, such as transporting them to a physician's office or health center, or even treating them on the

scene. To relieve pressure on EDs and avoid unnecessary costs, several professional organizations have recommended that CMS policies be changed.^{2,4–6}

To estimate the financial implications of allowing CMS to adopt a more flexible payment approach, we calculated the savings that might be accrued if CMS reimbursed EMS providers for a wider range of transport and treatment options.

Study Data And Methods

Our study had two specific aims. First, we sought to estimate the potential impact on the number of EMS transports if CMS policy enabled EMS to manage selected Medicare beneficiaries who do not require ED services in alternative ways. Second, we sought to estimate the potential savings that this might generate for Medicare.

DATA SOURCES We obtained complete Medicare claims data from CMS for a random 5 percent sample of beneficiaries for the period 2005–

09, the most recent years for which such data were available. The unit of observation was a Medicare-covered ambulance event. Ambulance claims data were obtained from the Carrier and Outpatient Standard Analytic Files. Ambulance claims include information on the total cost of each transport, the level of service provided (for example, basic or advanced life support), the origin and destination, and the number of miles traveled. Combined, these files produced 3,974,724 unique transports billed to Medicare.

For each transport, we identified the associated Medicare claims for ED care and all other services. We linked each ambulance claim to its associated ED claims using the Medicare beneficiary's identifier and the date of service. The use of claims data allowed us to estimate with a high level of precision Medicare's aggregate costs for EMS transport and subsequent treatment in hospital EDs.

CASE DEFINITION Using the codes for the origin, destination, and service level of ambulance transports, we identified all Medicare payments to EMS for emergency responses that resulted in ground transport to an ED. We excluded pre-designated nonemergency ambulance transports (Healthcare Common Procedure Coding System [HCPCS] codes A0426 and A0428);^{7,8} hospital-to-hospital transfers; EMS transports originating from a physician's office, end-stage renal disease facility, or a diagnostic or therapeutic site other than a hospital, physician's office, or skilled nursing or assisted living facility; and air or water transports (HCPCS codes A0430, A0431, A0435, and A0436).

We also excluded all EMS transports to the patient's residence, a skilled nursing facility, or another residential or custodial facility; those that took place during the middle of an inpatient stay; those for cases with a missing service level or origin; and those with missing ED records. Appendix Table 1⁹ shows the frequency of each of these cases and the cumulative number of excluded observations.

Excluding these cases left us with 1,784,795 EMS transports to hospital EDs that were initiated with 911 calls. Because this count is based on a 5 percent sample of all Medicare claims, it implies that during the five-year study period, EMS units made an annual average of 7,139,180 Medicare-reimbursed transports to EDs. This estimate is similar to the number of EMS transports of people ages sixty-five and older (7,222,875) reported by the 2008 National Hospital Ambulatory Medical Care Survey (NHAMCS).¹

ANALYSIS Our analysis involved a three-step process. First, we excluded 973,489 Medicare EMS transports that resulted in hospital admis-

sion because few of these patients would be suitable for care in alternative settings.

Second, we applied to the remaining 45 percent of transports (811,306) a previously validated algorithm developed by John Billings and colleagues to classify ED visits into the following four categories of severity based on the primary discharge diagnosis: nonemergent; emergent and primary care treatable; emergent, ED care needed, and preventable or avoidable; and emergent, ED care needed, and not preventable or avoidable.¹⁰ Although the algorithm has been widely used by other groups to estimate the proportion of ED visits that might be preventable or treatable if primary care were more readily available, it is not intended to be used as a triage tool.¹¹

ED visits related to injuries, mental health problems, alcohol use, or drug use are not addressed by this algorithm and were classified separately. Patients with more than one primary diagnosis were categorized by their most severe condition.

Third, based on the output of the algorithm, we estimated the overall proportion of Medicare EMS transports that might be nonemergent or emergent and primary care treatable. Cases of this sort might be candidates for management in settings other than EDs.

To compute the costs associated with transporting patients with such low-acuity conditions to EDs, we summed the payments made for ambulance transport and ED facility and physician fees for each primary diagnosis, weighted by the percentage of patients that the algorithm classified as nonemergent or emergent and primary care treatable. Payments were adjusted for inflation to be presented in 2011 dollars.

LIMITATIONS Our analysis was limited in certain respects. First, the algorithm we used was originally developed by Billings and colleagues to evaluate access to primary care in communities.¹⁰ Another group used it recently to estimate the proportion of ED visits and hospitalizations of Medicare beneficiaries that might be preventable.¹¹ It is the best available tool for estimating the proportion of ED patients who might be safely managed in other settings. However, it is not intended to be used as a triage tool, as noted above, because there is little concordance between a patient's presenting complaint and the final diagnosis.^{12,13}

Second, because the algorithm was derived from a general population of ED patients, it might overestimate the percentage of Medicare beneficiaries who could be safely managed in non-ED settings and the potential savings. Also, because the algorithm was derived from ED visits in New York City, it might not be generalizable

to the nation at large.

Furthermore, it is possible—perhaps even likely—that ED costs associated with the care of patients categorized as emergent with a particular diagnosis are higher, on average, than ED costs associated with patients categorized as either nonemergent or emergent and primary care treatable. Thus, using the mean cost of treating patients with each diagnosis might overestimate, to some degree, the potential savings of managing patients with less acute conditions in alternative settings.

Third, although we excluded ED patients who were admitted to the hospital, physicians sometimes admit patients whom others might judge to be reasonable candidates for outpatient treatment. To the degree that such patients are deemed candidates for alternative management, the potential cost savings would be increased.

Fourth, EDs operate around the clock, but few outpatient facilities do.¹⁴ Because CMS claims do not record the time of day that a service was provided, we could not estimate the proportion of nonemergent patients who called 911 at times when alternative destinations were closed. In such instances, an EMS crew might transport a suitable patient to an after-hours urgent care center¹⁵ or arrange for nonemergency transport to a clinic the following morning. To the degree that no feasible alternatives exist, potential savings would be reduced.

Fifth, Medicare beneficiaries account for roughly 40 percent of EMS transports to EDs (tabulation of aggregate NHAMCS-ED survey data from 2003–08; Stephen R. Pitts, Emory University, personal communication, August 9, 2012). If other payers followed CMS's lead, the societal savings we project could be twice as large.¹⁶

Sixth, even under current CMS policies, up to 26 percent of 911 responses do not result in transport.¹⁷ If Medicare were to revise its policies to reimburse for 911 calls that currently do not result in transport, the addition of these calls might reduce the apparent savings. It is even possible that the number of nonemergency calls to 911 might increase. As patients became aware of expanded EMS services, some might call 911 to receive “house calls” or free transport to health care providers. Obviously, any change in policy would have to be carefully monitored to detect abuse.

Some private payers might be tempted to deny reimbursement for EMS responses that were retrospectively determined to be for nonemergency cases. This approach would be difficult to implement. It would also likely conflict with section 10101(b)(2)(A) of the Affordable Care Act, which requires insurers to cover emergency ser-

EMS providers regularly encounter patients whose complaints might be better managed in settings outside the ED.

vices if an average person determines that without medical attention, he or she could expect the condition to deteriorate to serious disability, injury, or death. This is often referred to as the “prudent layperson” standard.

Similarly, hospital-owned EMS units might be reluctant to embrace this approach for fear of violating the Emergency Medical Treatment and Active Labor Act (EMTALA) of 1986, which requires the treatment of patients requesting care from hospitals and is extended to hospital-owned ambulances. Requiring EMS crews to consult with online medical control—that is, to receive direction from a physician via radio or telephone—and to always accede to the patient's wishes regarding ED versus non-ED care might reduce this concern.

Given these various limitations, our estimated cost savings might be higher than what could ultimately be achieved. However, even if the actual savings were half as large as our baseline estimate, or an even smaller share of our most conservative sensitivity analysis (described below), the potential savings are still large enough to justify prospective research to assess the feasibility and safety of a change in policy. Of course, any change this consequential must be evaluated for safety before being widely adopted.

Currently, paramedics are neither trained nor equipped to identify patients with nonemergent conditions in prehospital settings.^{5,18,19} Pilot programs suggest that with supplemental training, medical oversight, and perhaps mobile forms of telemedicine, the use of alternative destination protocols might be feasible.²⁰ However, more evaluation is needed.²¹ The Center for Medicare and Medicaid Innovation and the Patient-Centered Outcomes Research Institute might consider supporting research on this topic.

EXHIBIT 1
Numbers And Costs Of Emergency Medical Services (EMS) Transports Of Medicare Beneficiaries, By Level Of Severity Of Emergency Department (ED) Discharge Diagnosis

	Level of severity ^a				ED visits related to: ^b			
	Primary care treatable		Emergent, ED care needed		Injury	Mental health	Alcohol use	Drug use
	Nonemergent	Emergent	Preventable or avoidable	Not preventable or avoidable				
Transports not admitted to hospital ^c	14.1%	20.4%	10.3%	32.5%	16.0%	2.1%	0.7%	0.1%
5% MEDICARE SAMPLE, 2005-09								
Transports	114,028	165,196	83,382	263,392	129,724	16,694	5,662	698
Out-of-pocket costs (millions)								
Ambulance	\$10.06	\$15.11	\$7.77	\$24.94	\$11.38	\$1.46	\$0.52	\$0.06
ED	18.32	30.70	15.59	61.63	23.19	1.73	0.59	0.08
Medicare costs (millions)								
Ambulance	\$38.01	\$57.25	\$29.46	\$ 94.51	\$42.65	\$5.44	\$1.91	\$0.24
ED	55.90	99.81	52.95	200.49	64.72	6.07	2.10	0.29
EXTRAPOLATED TO NATIONAL MEDICARE POPULATION, PER YEAR								
Transports	456,112	660,782	333,528	1,053,566	518,896	66,776	22,648	2,792
Out-of-pocket costs (millions)								
Ambulance	\$40.24	\$60.46	\$31.09	\$ 99.77	\$45.51	\$5.85	\$2.08	\$0.25
ED	73.29	122.79	62.36	246.52	92.76	6.93	2.37	0.33
Medicare costs (millions)								
Ambulance	\$152.06	\$229.00	\$117.85	\$ 378.04	\$170.61	\$21.77	\$ 7.63	\$0.96
ED	223.59	399.24	211.81	801.97	258.89	24.27	8.41	1.16
Total Medicare costs	375.65	628.23	329.66	1,180.01	429.51	46.04	16.04	2.12

SOURCE Authors' analysis. **NOTE** All costs are in 2011 dollars, adjusted for inflation by the medical Consumer Price Index. ^aSee Billings J, et al., Emergency department use (Note 10 in text). ^bED visits not assigned a level of severity by Billings J, et al., Emergency department use (Note 10 in text). ^cN = 811,306. Percentages do not sum to 100 because 4 percent of transports not admitted to the hospital had an unclassified severity level.

Study Results

We calculated that 34.5 percent of 911 EMS transports of Medicare beneficiaries who were not hospitalized were relatively low-acuity cases (either nonemergent or emergent and primary care treatable), which made them potential candidates for management at a site other than the ED (Exhibit 1). This represents 15.6 percent of all

Medicare-covered 911 EMS transports to EDs.

Annual payments for EMS and ED care of these patients averaged approximately \$1 billion per year. Of this amount, one-third (\$381 million) was paid to ambulance services, and the remainder (\$623 million) went to the EDs and physicians receiving these patients (Exhibits 1 and 2). Had these patients been managed in less expen-

EXHIBIT 2
Estimated Annual Medicare Costs For Potentially Preventable Emergency Medical Services (EMS) Transports To The Emergency Department

	Potentially preventable transports as percent of:		Medicare costs (\$)		
	All EMS transports	Transports not admitted to hospital	Ambulance	Emergency department	Total
Baseline	15.6%	34.5%	381,054,608	622,830,432	1,003,885,040
Excluding:					
Nursing home cases	16.2	35.0	323,750,760	529,983,264	853,734,024
Injury cases	12.9	28.3	314,711,344	500,916,816	815,628,160
Weekend cases	15.5	34.4	276,155,144	457,993,040	734,148,184
Nursing home, injury, and weekend cases	13.4	28.9	194,748,736	315,453,952	510,202,688

SOURCE Authors' analysis. **NOTES** Potentially preventable transports are cases whose level of severity was classified as nonemergent or emergent and primary care treatable (see Note 10 in text). All costs are in 2011 dollars, adjusted for inflation by the medical Consumer Price Index.

\$560 million

Saved

If low-acuity cases were managed in less expensive settings, Medicare could save roughly \$560 million per year.

sive settings, such as a doctor's office or an urgent care center, Medicare could have saved roughly \$560 million per year (Exhibit 3).

To estimate this total, we assumed that patients would be transported to their regular primary care providers. In that case, Medicare would pay the evaluation and management fee associated with an established patient (HCPCS code 99213). If patients were taken to a new outpatient provider, instead of their usual one, the fee would be higher (\$84.14 versus \$56.37 in 2012), reducing potential savings. If, however, EMS crews managed selected patients on scene with the concurrence of online medical control, the cost could be lower and the savings greater.

Some EMS providers might expect to receive an additional fee for rendering on-scene care. However, it is also possible that some providers would prefer to receive—instead of no payment at all—the same fee for on-scene care that they receive for transporting a patient to an ED, without the additional time and expense of transport.

Given the uncertainties in these projections, we performed several sensitivity analyses (see Exhibits 2 and 3 and the Appendix).⁹ In the first alternative scenario, we excluded transports originating from nursing homes, because a health care worker with some training probably initiated the call. In the second scenario, we excluded patients having any injury diagnosis, regardless of severity. In the third scenario, we excluded weekend cases, because alternative sites of care such as a physician's office are unlikely to be open on those days. When we used these more conservative assumptions, the annu-

al savings to Medicare ranged from \$283 million to \$477 million, with 12.9–16.2 percent of transports classified as low acuity.

Discussion

Because EMS is a transportation benefit, CMS does not reimburse EMS calls unless transport actually occurs, and it incentivizes transport to a hospital ED. This discourages emergency personnel from treating patients whose conditions would permit it on scene or from transporting them to less costly settings than the ED. During the past decade groups such as the American College of Emergency Physicians, the National Association of EMS Physicians, and the Institute of Medicine have noted that this policy creates a perverse incentive for EMS providers to transport all 911 callers to a hospital ED, regardless of patients' needs or willingness to consider less costly alternatives.²⁻⁵

There is widespread agreement that some percentage of 911 calls could be managed in non-ED settings, but that figure has been difficult to quantify. Previous studies have offered estimates ranging from 11 percent to 61 percent.^{4,22-25} Our estimate—15.6 percent—is in line with the lower boundary of this range.

Based on this figure, we estimate that CMS spends \$1 billion per year on Medicare beneficiaries who call 911 for conditions that are not urgent or could be treated by primary care. Two-thirds of this goes to the downstream costs of EDs and physicians treating these beneficiaries, and the remainder goes to EMS providers.

EXHIBIT 3

Estimated Annual Medicare Cost Savings For Using Alternative Care Settings For Potentially Preventable Emergency Medical Services (EMS) Transports To The Emergency Department (ED)

	Potentially preventable transports	Medicare costs (\$)		
		ED (actual)	Physician office (estimated) ^a	Medicare cost savings (\$) ^b
Baseline	1,116,894	622,830,432	62,959,315	559,871,117
Excluding:				
Nursing home cases	947,302	529,983,264	53,399,441	476,583,823
Injury cases	919,365	500,916,816	51,824,603	449,092,213
Weekend cases	808,544	457,993,040	45,577,614	412,415,426
Nursing home, injury, and weekend cases	567,499	315,453,952	31,989,894	283,464,058

SOURCE Authors' analysis of data from the following sources: (1) CMS.gov. Medicare Physician Fee Schedule: overview [Internet]. Baltimore (MD): Centers for Medicare and Medicaid Services; [cited 2013 Nov 1]. Available from: <http://www.cms.gov/apps/physician-fee-schedule/overview.aspx>. (2) Medicare Payment Advisory Commission. Physician and other health professionals payment system [Internet]. Washington (DC): MedPAC; 2012 Oct [cited 2013 Nov 6]. Available from: http://www.medpac.gov/documents/medpac_payment_basics_12_physician.pdf. ^aThe Medicare cost of a low-acuity physician office visit is estimated to be \$70.46 in 2012, assuming a nonfacility setting such as a physician's office, an established patient, and a visit for the patient's evaluation or management that includes the following three components: a detailed history, a detailed examination, and low-complexity medical decision making. The beneficiary pays 20 percent of this cost, and Medicare pays the remaining \$56.37. To estimate the total costs to Medicare for these visits, we multiplied 56.37 by the number of potentially preventable transports. ^bMedicare ED costs minus Medicare physician office costs.

Bringing patients unnecessarily to the ED places needless demands on an already overburdened system.

generate annual savings of \$283–\$560 million or more. If private insurance companies followed suit, the societal savings would be greater still.

High costs are but one consequence of CMS's current approach. Bringing patients unnecessarily to the ED places needless demands on an already overburdened emergency care system. It can worsen ED crowding, exacerbate delays in treatment, prompt needless diagnostic testing, and potentially increase the risk of medical errors.^{12,26–28}

Conclusion

Giving CMS the flexibility to reimburse EMS services for alternative handling of 911 callers could save Medicare \$283–\$560 million or more per year. If private third-party payers followed suit, the societal savings could be twice as large. If prospective research confirms that EMS providers can safely identify patients with low-acuity conditions and manage them in non-ED settings, they should be encouraged to do so. ■

The Affordable Care Act realigned many incentives in the provision of health care. However, it did not address payment issues related to EMS. If Congress gave CMS the statutory authority to allow EMS a wider range of treatment and transport options, the agency could promote patient-centered EMS care.³ Simultaneously, CMS could

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