

A Novel Approach to Identifying Targets for Cost Reduction in the Emergency Department

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This article introduces a novel framework that classifies emergency department (ED) visits according to broad categories of severity, identifying those categories of visits that present the most potential for reducing costs associated with the ED. Although cost savings directly attributable to the ED are apt to be an important emphasis of organizations operating under reformed payment systems, our framework suggests that a focus on diverting low-acuity visits away from the ED would result in far less savings compared with strategies aimed at reducing admissions and to a lesser extent improving the efficiency of ED care for intermediate or complex conditions. We conclude that targeting these categories, rather than minor injuries/illnesses, should be the primary focus of cost-reduction strategies from the ED. Given this understanding, we then discuss the implications of these findings on the financing of an emergency care system that needs to account for the required fixed costs of “stand-by capacity” of the ED and explore ways in which the ED can be better integrated into a patient-centered health care system. [Ann Emerg Med. 2012;xx:xxx.]

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INTRODUCTION

The dire need to control increasing costs in the US health care system has prompted a renewed debate about the role of emergency departments (EDs) and emergency care in the US health care system. Although ED expenditures account for between 2% and 4% of overall health expenditures,¹⁻³ the ED serves as a gateway to the substantial costs associated with hospital admission.⁵ Additional testing and care delivered in the ED may also be more intensive than that delivered in other settings, though the cost implications of this are not well defined. Furthermore, ED visits continue to increase, and many policymakers reflexively use EDs as an example of overly expensive health care and tout the potential cost savings from reducing “nonurgent” or “inappropriate” ED visits.⁴ Despite this perception, there is no clear consensus about how many patients (or which types of patients) could be treated in alternative settings, nor is there a clear understanding of the potential savings that might be achieved by diverting ED care to alternative delivery settings.

The goal of this article is to propose a novel classification system for considering the cost savings potential of different types of visits to the ED. In doing so, we consider the optimal role of the ED within a reformed health care delivery system of the future, one that improves and integrates the delivery—and likely the payment—of care and improves the health of populations while controlling costs.

COST CONTROL AND HEALTH PAYMENT REFORM

The current fee-for-service payment system is seen as one of the primary contributors to high US health care costs because it

promotes excessive use of services, often reinforced by overwhelming patient demand. Reforming the way that physicians and others are paid for their services has therefore become a focus of the Centers for Medicare & Medicaid Services Innovation Center and many policymakers. The principal intent of payment reform is to promote efficient use of resources, thereby increasing the value of care.

The major alternatives to fee-for-service include episode-based bundled payments and global payments.⁵ Pay-for-performance programs can be used in combination with any of these approaches. Moreover, some payment systems such as those envisioned under medical home payment models might combine aspects of several of these systems in addition to fee-for-service payment.⁶ Episode-based payments reimburse providers for the expected costs of services provided for clinically defined episodes of care, typically defined by selected conditions or major procedures such as hip replacement or coronary artery bypass graft surgery. In contrast, global payment (capitation) models provide prospective payment to groups of providers for all care required during a defined period, not simply the care related to a single procedure or clinical condition. Organizations that spend less than their budgeted amount retain the surplus, whereas those that spend more generally are responsible for at least a portion of any deficit. Each organization decides how to spread risk and divide revenue internally. As with fee for service, global payments can be used alone or in conjunction with pay-for-performance measures and integrated care models such as the medical home.

The overall purpose of the global payment model is thus to put the health care system on a fixed budget, with a predictable and slower rate of growth than observed under current payment systems. Global payments theoretically provide strong incentives to improve both the efficiency of the system through more appropriate use and the health of populations through proper alignment of incentives and integration of care. This is the central idea behind programs such as the Centers for Medicare & Medicaid Services' Shared Savings Program and the recently implemented Pioneer Accountable Care Organization program.⁷

Because EDs are seen as overly expensive settings of care, organizations accepting global payments are likely to focus efforts on reducing use of the ED through a variety of mechanisms. Thus, payment reform has the potential to alter use of the ED.

ED USE AND FINANCING IN THE CURRENT US HEALTH SYSTEM

The ED currently serves the dual roles of delivering emergency care and serving as a safety net provider. ED visits in the United States continue to increase at rates faster than population growth, with an increase between 1997 and 2007 of 23%, from 94.9 million to 116.8 million visits per year.⁸ Because EDs are required by federal law to provide services regardless of ability to pay,⁹ the ED has become the de facto safety net of the health care system for patients with no other source of care,¹⁰ and up to 25% of patients visiting the ED at any given time state that it is their usual source of care.¹¹⁻¹⁴ However, simply providing insurance coverage is unlikely to stem the increase in the use of the ED because there are multiple additional reasons patients choose to use EDs, ranging from convenience and 24-hour availability of care to poor access to other sources of care such as primary care offices, which often leads to referrals from primary care to the ED.¹⁵⁻¹⁹

There are several features of the way that EDs are financed under the current health care system that must be considered under reformed payment models. First, as with other sectors of the health care system, the existing fee-for-service system creates incentives for EDs to increase volume. In particular, the economic feasibility of the ED depends on payments for lower-severity visits. These visits, in part, are used to support true emergency care, which is relatively underreimbursed, and are the cost of keeping the ED open 24 hours a day.^{20,21} As a consequence, savings achieved by diverting nonurgent care to other settings will likely need to be offset at least in part by additional funding required to support the full costs of maintaining an ED for truly emergency care. The additional "facility" charges for ED visits result in higher overall charges for equivalent-level visits than those in the outpatient setting, though the physician payments themselves are similar. The details of comparative payment rates are illustrated in Table 1, using 2011 Medicare ED and office visit evaluation and management payment rates as an example.²²

Table 1. Medicare 2011 national unadjusted payment rates.²²

Visit Level	ED Physician Payment Rate, \$	ED Facility Payment Rate, \$	Office Visit Payment Rate, \$*
1	21.02	51.77	41.11
2	41.30	87.25	71.02
3	62.68	139.14	102.95
4	118.73	222.58	126.41
5	174.77	329.54	162.42

*Except under rare exceptions, there is no separate facility component for office visits.

Furthermore, under current reimbursement systems, hospitals generally benefit financially from additional admissions that arise from the ED. The ED is the conduit to almost 50% of hospital admissions,²³ and hospitals have little incentive to make investments that will result in decreased ED visits and admissions because this will result in decreased revenue, although this may not be true in all cases. For example, trauma centers and safety net hospitals in which many ED patients are uninsured or underinsured (admissions from the ED could be net revenue loss) clearly face different incentives than hospitals with a better payer mix or hospitals with greater market power who have negotiated favorable payment rates. Nevertheless, the principle holds constant that under global payment systems the incentives faced by hospitals and EDs will be markedly different. Changing these patterns will require investments in systems and infrastructure (ie, primary care and medical homes, home health care, transitional facilities) that allow patients to be treated outside of the hospital.

Finally, even under a reformed health care system, the standby capacity of the ED for treating true emergencies needs to be maintained. No matter how many improvements are made in the quality and efficiency of health care delivery, there will always be emergencies. For example, severe trauma cases are resource and time intensive, and the ED must be staffed to care for the potential trauma patient and at the same time to be ready for the possible concomitant stroke, heart attack, and shoulder dislocation. In addition, EDs must maintain the capability to respond to pandemics, disasters, and seasonal spikes in volume such as during severe flu seasons. Consequently, staffing and resource levels can never decrease below a certain floor of preparedness. Duckett and Jackson²⁴ described this standby capacity as a public good because the ED (like a fire department) provides an availability product that serves all members of the public in the market area who might potentially benefit from the provision of care. This standby capacity plays substantially into the fixed cost of the ED.

The totality of these features means that reducing ED costs may not be as simple as diverting some proportion of care to other settings. Moreover, different types of ED visits may represent varying opportunity to reduce costs.

Table 2. ED utilization interventions and associated effect on use and cost.

Strategies	Type of Strategy	% Change in Utilization	Associated Cost Savings	Other Concerns	Author
Demand side					
	Copayments	32% higher hospitalizations for free care group	18% higher ED expenditures for free care group	Level of copayments that may restrict seeking care for emergency conditions not fully understood	O'Grady ²⁷
	High deductible plan	10% lower ED use for high-deductible plan members	Not quantified		Wharam ²⁸
Supply side					
	Patient-centered medical home	29% reduction in ED visits for medical home members	\$10.30 per patient per month savings overall (pilot results)		Reid ^{26,29}
	Patient-centered medical home	7% decrease in ED visits for medical home members (children with asthma)	Not quantified		Diedhiou ³⁰
	Managed care plan for the uninsured services	43% decrease in ED visits for those who switched to a managed care plan	No difference in overall cost	Presumed increased in primary care use likely accounted for lack of difference in cost savings	Kravitz ³¹
	Medicaid primary care management	No statistically significant decrease in ED visits for participants of primary care management program	Not quantified		Hurley ³²
	Uninsured patients then enrolled in a managed care plan	Increased trend of ED use over time (despite modest increase in primary care utilization)	Not quantified		Kwack ³³
	Patient-centered medical home	18% decrease in admissions for acute exacerbations of chronic disease, 20% decrease in readmission rates overall, no change in overall ED visits for medical home members	Not quantified	Pilot results	Paulus ³⁸
	Global payment	No change in ED utilization	No cost savings associated with the ED	Patients not informed their provider was part of a global payment contract	Blue Cross Blue Shield "alternative quality contract" ³⁴
Point of care					
	Triage to alternative sites	19% characterized as nonurgent and redirected to alternate care sites	Not quantified		Derlet ³⁵
	Retrospective application of Derlet criteria	3.9% of those meeting Derlet criteria for refusal of care were hospitalized			Lowe ³⁶
	Triage to alternative sites	1.1% of those meeting Derlet criteria for refusal of care were hospitalized	Not quantified		Birnbaum ³⁷

Table 3. Framework for categorizing ED visits.

Category	Examples	Components of Cost	% of Total Visits ⁴²	Expected Potential Cost Savings
Emergencies	Trauma, medical (eg, stroke), surgical (eg, acute abdominal pain)	Expense of ED visit	10%–16%	No available cost savings
Intermediate/complex conditions	1) Complex chronic disease: congestive heart failure, chronic obstructive pulmonary disease, diabetic complications 2) Acute presentations of disease: urinary tract infection, pneumonia, abdominal pain, angina, atypical chest pain	Increased testing, increased likelihood of admission	31%–57%	Reduction of 1.0%–2.5% of total health spending
Minor injury/illness	Sore throat, cough, sprains, rash	Price of ED visit, possibly increased testing compared with primary care visit	12% to 40%	Reduction of 0.24% to 0.8% of total health spending

A MEANINGFUL TYPOLOGY FOR ED VISITS WHEN CONSIDERING POTENTIAL COSTS SAVINGS

In the context of health reform, there is significant focus by public and private purchasers of care on reducing ED utilization under the premise that there is the potential for cost savings from preventing substantial numbers of potentially avoidable visits, along with their associated downstream costs.^{4,25} In the past, a variety of strategies to reduce ED utilization has been attempted, with mixed results (see Table 2, which includes representative examples of these strategies).^{26–38}

Current ED visit classification schemes such as the Billings NYU algorithm were developed according to retrospective determinations of severity, but these are not useful for prospectively identifying types of visits in which interventions might be successful.³⁹ When visits are categorized prospectively with data available at triage, lower rates of nonurgent visits are identified, suggesting the potential difficulty in identifying cases that might be treated in other settings.⁴⁰ Despite these issues, policymakers and others have continued to use nonurgent visits as defined with the Billings algorithm to characterize overuse of the ED and to estimate potential health system savings from diverting these visits to other settings.^{4,17}

A more useful classification scheme for health systems operating under global payments would be based on categories related to the potential for interventions to affect either ED use or the cost of ED visits and subsequent care conditional on use. Although some interventions may reduce ED use, they may not be accompanied by substantial cost savings, whereas programs that are directed at affecting the clinical content or trajectory of an ED visit might have a much larger effect.

Our framework divides ED visits into 3 categories: emergency, intermediate/complex, and minor injury/illness (Table 3). For each category, we identify the components of the visit that account for the visit's marginal contribution to costs, particularly when compared to a similar visit in a primary care setting. We also estimate a range of the percentage of total ED

visits contributed to by this category of visits, extrapolated from a breakdown of visit severity in our previous work, using a modification of the Billings algorithm and from the Centers for Disease Control and Prevention's (CDC's) use of visit categorization by visit severity.^{23,41,42} Finally, we estimate the potential costs savings associated with modifying ED use in each category.

We estimate that minor injuries and illnesses account for 12% to 40% of ED visits. Based on the fact that ED care accounts for 2% to 4% of total health expenses,^{1–3} this category of visits would account for approximately 0.42% to 1.6% of overall expenses, assuming that these visits, on average, are as costly as higher-severity visits. Even if this category of visits decreased by 50%, this reduction would decrease total health expenses by only 0.24% to 0.8%. However, this estimate is likely to represent an upper bound on potential savings because these visits, on average, are likely far less costly than higher-severity ED visits and it is highly unlikely that half or more of low-severity visits could be diverted to other settings, particularly when low severity is defined according to a retrospective rather than a prospective classification system.

In contrast, the category of intermediate/complex conditions accounts for 31% to 57% of all visits. If clearly emergency visits that almost always result in a hospitalization are 10% to 15% of visits (thus about 20% to 25% of admissions), then the intermediate or complex category of visits is responsible for the majority of admissions (likely 75% to 80%). This assumes that few admissions come from the minor injuries or illnesses. Nevertheless, we have chosen a conservative estimate of two thirds of admissions coming from this group to avoid overstating the potential savings from this category. Hospital-based care accounts for approximately 30% of total health expenses.² Because 50% of admissions now originate from the ED,²³ visits resulting in admission thus account for roughly 15% of total health expenses. According to our classification scheme, 10% of total health expenses (two thirds of 15%) would result from admissions for this intermediate to complex

visit category. If the system overall could reduce admissions from this category by 10% to 25%, this could result in savings of approximately 1.0% to 2.5% of total health expenditures.

A few salient points are immediately apparent. First, emergency visits are unavoidable and not a major source of expected cost savings. These visits require ED care and the expensive resources available in the modern ED. Second, although seemingly “low-hanging fruit,” diverting minor injuries or illnesses to other settings would not be expected to result in substantial cost savings, even with diverting up to 50% of visits. The cost of these visits is responsible for a small proportion of the 2% to 4% of total health expenditures accounted for by the ED. In contrast, visits of intermediate severity, including exacerbations of chronic disease and acute presentations of complex medical illness, have the most potential for substantial cost savings, mainly through reduced admissions yet also to a lesser degree from streamlined ED evaluations. Because admissions from the ED total about one half of hospital admissions,^{3,23} even a small reduction could result in significant savings. Even without taking into account the additional cost of treating some of the lower-severity conditions in an alternative setting, it would require diverting more than 80 patients with pharyngitis to save the money equivalent to a single avoided hospitalization. However, the additional cost of establishing new urgent care centers or adding after-hours or weekend primary care availability is not trivial and is likely to substantially undermine or eliminate entirely the cost savings from diverting minor visits. Moreover, to the extent that these alternative settings end up with excess capacity (eg, unused appointments), the savings will be even less. Thus, solutions for avoiding unnecessary expenditures that result from the ED will require multidimensional efforts aimed at this intermediate category of patients. For example, in managing chronic disease such as congestive heart failure, the goals may be both to decrease ED visits for patients with congestive heart failure and to provide streamlined ED pathways and mechanisms for reducing admissions once the patient is already in the ED.

As indicated in Table 3, there are opportunities for interventions to be made at the level of the ED visit, according to this schema to achieve cost savings and potentially reduce admissions that have been previously underused. For instance, the expanded use of ED observation units for defined diagnoses with expected short-term stays is one area of potential increased efficiency and cost reduction. Emergency physicians working with case managers and community-based services also could play a wider role in enabling patients to be cared for by home services or placed into short-term or long-term care facilities rather than being hospitalized for a lack of safe alternative options. Optimal care for the ED patient also will require improvements in collaboration between the care team in the ED and the primary care team, an essential component of the evolving concept of the accountable care organization, within which the idea of closely coordinated care in a medical home is

essential to improving health and providing care in the optimal setting. Central to this are robust health information technology systems, vital to improving care coordination through facilitating communication and providing greater information by which emergency physicians can make crucial decisions about testing and disposition of complex patients.

PAYMENT REFORM CONSIDERATIONS AND THE ED

Although this article does not intend to lay out in full a roadmap for changes in the financing structure for EDs in every particular market situation, our framework naturally forces some reconsideration of the current system of financing emergency care. The reality of financing emergency care in the health system of the future will need to balance the seemingly competing challenges of improving the value of ED care while preserving the availability of true emergency care. To ensure the financial feasibility of EDs, some authors have suggested constructing more appropriate reimbursement for urgent conditions to reduce the financial imperative for EDs to rely on nonurgent volume.^{43,44} Similarly, if EDs received separate funding to support infrastructure, much of the low-acuity urgent care volume could be treated with a relatively low marginal cost,⁴⁵ particularly compared to constructing or staffing after-hours and weekend urgent care in primary care settings.²¹

So where should the ED sit in a system where capitated or “global” payments are distributed to provider groups or health care systems? In part this depends on the structure of the organization. There may not be a one-size-fits-all approach to the ED within the future accountable care organization. In systems in which large provider groups engage in risk-based contracts with hospitals, ED visits could be paid by some negotiated per-member per-month rate, fee-for-service, or some combination of both that was sufficient to guarantee the provision of around-the-clock emergency services. To the extent that the ED continues to be paid by the current fee-for-service fee schedule, success at diverting low-acuity cases away from the ED may need to be accompanied by increased payments to cover the full costs of preparedness for true emergencies. Because emergencies are never totally predictable, and because it is unlikely that payers will want to subsidize the fixed cost for maintaining standby capacity for all patients, a per-member per-month payment would be unlikely to cover the true costs of operating EDs. Furthermore, for patients who seek care at EDs outside their contracted hospital, care would need to be reimbursed by fee for service. The most realistic scenario might be to continue to reimburse EDs on a fee-for-service basis but with some modifications to properly value highly acute or complex cases in comparison with the lower-urgency cases.

Regardless of the payment structure, the ED must play an integral role in the expanded effort to better coordinate care for its patients. Again, the structure of this may differ, depending on the size of the organization. For example, risk contracts may opt to provide additional payments for reaching certain

performance measures related to care coordination. The ED could in theory share in savings accrued to the organization for its part in improving ED evaluation efficiency or avoiding admissions. Furthermore, both large and small groups should rely on developing direct relations and programs with an ED to improve coordination of care for their patients. For example, establishing next-day follow-up for certain categories of visits (eg, cellulitis, pneumonia, chronic obstructive pulmonary disease) in which admissions could potentially be avoided but are also at high risk of deteriorating or failing outpatient treatment could allow emergency physicians more flexibility in discharging patients who may have previously been admitted. Although the approach to coordinating care may take many forms, the classification scheme introduced here can help administrators target the subcategories of ED visits in which interventions may be feasible and cost-effective.

We might also glean some lessons from how single-payer systems finance their system of emergency care. Under these systems, funders must recognize and pay for the range of functions provided by the ED, including teaching, research, preventive care, clinical stabilization, disposition, providing a diagnostic and even therapeutic alternative to inpatient care, and its “standby or availability product.”²⁴ If the Emergency Medical Treatment and Active Labor Act recognizes the necessity of universal access to emergency care, by extension this funding model would recognize the necessity of funding this care. Because it is often the charge, not the cost, of emergency care that is so substantial, an external single- or even multiple-payer funding mechanism for emergency care could ensure the financial feasibility of EDs. Separate capitated payments directed to primary care would continue to promote efficient outpatient and specialty care utilization. This funding mechanism would need to account for both the fixed costs (plant, minimum staffing requirements) and the variable costs (consumables, diagnostic, and therapeutic interventions) that are related to the number and type of patients treated.²⁴ It follows that funding would include a mixture of a pure case-mix payment approach and fixed-grant approach, which recognizes the many cost drivers of hospital ED functions.²⁴ This type of mixed payment approach is commonly used to support hospitals in Australia and some European countries.²⁴

Although payments for fixed costs may not be feasible in our complex health care system, some additional funding akin to federal Disproportionate Share Hospital payments could be useful to support important but potentially unevenly distributed ED services (eg, trauma care, pediatric care). Although many of the particular details for supporting equitable distribution of emergency services in a multipayer system may require some innovative financing approaches, the concept simply reinforces the importance of any financing system taking into account the cost of maintaining enough EDs to take care of a growing and aging population, as well as the capacity to take care of any emergency at any time. Consequently, measures such as limiting

reimbursement to EDs for “nonemergency” visits are not likely to be productive in the long run.

CONCLUSIONS

Envisioning the place of the ED in an improved, integrated health care system of the future may not be as simple as previously thought. Attempts at modifying ED utilization by redirecting lower-urgency visits are unlikely to provide significant cost savings. According to our novel framework, the greatest potential cost savings with respect to ED visits lies in the intermediate area of complex acute and chronic disease, not in diverting to other settings the minor injuries and illnesses that are often lumped into the term “nonemergency” ED visit. This is not to suggest that low-urgency visits are necessarily best treated by episodic visits to the ED or that the ED should serve as a replacement for timely primary care. Rather, we suggest that focusing on the nonemergency category of visits as a cost savings strategy in and of itself is not likely to yield substantial savings. Achieving cost savings will require a multifaceted approach: streamlined care within the ED, methods for preventing hospital admissions for patients already in the ED, and establishing pathways to effectively manage some of these visits in other sites of care. A simple focus on diverting visits ultimately will not result in substantial savings to the system or in meaningful improvements in the quality and coordination of care.

Our framework has a wide range for each severity category according to 2 entirely different ways of measuring visit severity. The modified Billings algorithm is based on the original retrospective algorithm,^{28,41,42} and the CDC’s categorization is based on a prospective determination of the urgency of visits. Our framework is not intended to replace the potential utility of the Billings algorithm as a way of using administrative databases to track trends in visits for vulnerable populations. Instead, our framework provides a novel way of considering visit severity according to potential cost savings. As such, it should be a useful tool for health policy planners and administrators, but not necessarily for researchers tracking utilization trends.

Finally, payment reform will need to consider the current financing system that creates incentives to increase low-acuity ED volume and does not adequately reimburse for the ED’s standby capacity or care of true emergencies. The unpredictable nature of emergencies does not lend itself well to full capitation, the exception being for large integrated systems in which all ED visits essentially come from within a single network. In these systems, it would be conceivable to cover the full costs of emergency care according to the expectation of a certain volume of visits and the preservation of standby capacity. In systems with multiple payers, for the reasons mentioned we suggest continuing to reimburse EDs on a fee-for-service model that is modified to reflect the true costs of emergency care. This approach should be feasible in a system in which most patients will have insurance as envisioned under the Patient Protection and Affordable Care Act, but again this may require additional funding to ensure that emergency services are available and

equitably distributed to serve communities in which reimbursement may vary substantially, even with near-universal health care.

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