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Protocol-Driven Emergency Department Observation Units Offer Savings, Shorter Stays, And Reduced Admissions

ABSTRACT Many patients who seek emergency department (ED) treatment are not well enough for immediate discharge but are not clearly sick enough to warrant full inpatient admission. These patients are increasingly treated as outpatients using observation services. Hospitals employ four basic approaches to observation services, which can be categorized by the presence or absence of a dedicated observation unit and of defined protocols. To understand which approach might have the greatest impact, we compared 2010 data from three sources: a case study of observation units in Atlanta, Georgia; statewide discharge data for Georgia; and national survey and discharge data. Compared to patients receiving observation services elsewhere in the hospital, patients cared for in “type 1” observation units—dedicated units with defined protocols—have a 23–38 percent shorter length-of-stay, a 17–44 percent lower probability of subsequent inpatient admission, and \$950 million in potential national cost savings each year. Furthermore, we estimate that 11.7 percent of short-stay inpatients nationwide could be treated in a type 1 unit, with possible savings of \$5.5–\$8.5 billion annually. Policy makers should have hospitals report the setting in which observation services are provided and consider payment incentives for care in a type 1 unit.

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Between 1997 and 2007 the number of emergency department (ED) visits in the United States rose at twice the rate of population growth.¹ Simultaneously, there was a decline in the number of EDs, an increase in the number of patients who spent extended periods in ED beds (referred to as “ED boarding”), and an increase in the number of tests and treatments that ED patients received.²

The Centers for Medicare and Medicaid Services (CMS) recently initiated efforts such as the Recovery Audit Contractor program to reduce avoidable costs across the entire Medicare program.³ This program targets a variety of health care claims patterns to identify over-

payments made by Medicare. Inpatient admissions with short lengths-of-stay that were deemed to be unnecessary were responsible for half of the overpayments that CMS recovered in the first year of the recovery audits.⁴

Payment for an entire inpatient admission is based on a single averaged diagnosis-related group (DRG) payment that is much higher than the payment for a shorter outpatient observation visit. Such observation visits are more cost based—that is, major individual components of the visit are paid for separately instead of being combined into an averaged payment, which would be much higher than the separate payments collectively.⁵ Medicare’s recoveries are based on the premise that it inappropriately

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made a higher DRG payment for short inpatient admissions that should have been billed as outpatient observation visits.

The convergence of trends in ED use has created a critical situation for which solutions are needed. One solution might be better use of observation visits, although this depends on the delivery model used.

Current Models Of Observation Services

A clinical context in which to consider both emergency and observation care is “time.” The treatment of acute or “time-sensitive” conditions is a central feature of emergency medicine. Some ED patients need more time than a busy ED is designed to provide (about six hours maximum) but less than twenty-four hours of inpatient care if their condition is managed actively. The care needed by these “6-to-24-hour” patients does not fall neatly into either the category of an ED visit or that of a full inpatient admission. They are not well enough for immediate discharge, but it is not clear that they are sick enough to warrant full inpatient admission. These patients are increasingly treated as outpatients using observation services, as defined by CMS observation policy documents.⁶

CMS defines *observation services* as outpatient care ordered by a physician and provided in a hospital bed (to either an inpatient or an outpatient) to determine the need for inpatient admission.⁶ This care is expected to be completed within twenty-four hours, with exceptional cases requiring more than forty-eight hours. Across the United States, observation services are provided in one of four distinct settings, which are defined by the presence or absence of two features: dedicated units and protocols (Exhibit 1).

EXHIBIT 1

Hospital Settings In Which Observation Services Are Provided

| Setting | Description | Characteristics |
|---------|---|---|
| Type 1 | Protocol driven, observation unit | Highest level of evidence for favorable outcomes Care typically directed by ED |
| Type 2 | Discretionary care, observation unit | Care directed by a variety of specialists Unit typically based in ED |
| Type 3 | Protocol driven, bed in any location | Often called a “virtual observation unit” |
| Type 4 | Discretionary care, bed in any location | Most common practice Unstructured care Poor alignment of resources with patients’ needs |

SOURCE Authors’ analysis. **NOTE** ED is emergency department.

Two-thirds of US hospitals deliver observation services without using an observation unit. In most of these hospitals, care is provided in a type 4 setting: a bed anywhere in the hospital (usually an inpatient bed), with unstructured care provided at the discretion of the treating physician.^{7,8} Some of these hospitals also treat observation patients in a type 3 setting: a bed in any unit using structured, condition-specific protocols. The remaining one-third of hospitals have a designated observation unit, which is typically adjacent to the ED but is sometimes located on an inpatient floor. Half of these hospitals use condition-specific protocols to treat patients (type 1 setting); the other half do not (type 2 setting).^{7,8}

The key elements required to manage type 1 settings, or units, have been described elsewhere⁸ (for more details on the seven key components of a type 1 ED observation unit, see Appendix Exhibit 1).⁹ They include a dedicated unit, operational guidelines, condition-specific protocols, appropriate staffing and administrative oversight, ancillary services support, and close attention to metrics of use and quality. Guidelines specify how patients are selected for the unit, how their conditions are managed, and the criteria for their discharge home. These guidelines are used to create “order sets,” or “protocols,” to ensure consistency in how patients are managed. Ancillary services and staff are aligned to ensure that protocols are followed.

Of the four settings, type 1—dedicated units with condition-specific protocols—have been the most studied and are associated with the best outcomes. These include lower costs, shorter lengths-of-stay, lower rates of inpatient admissions, less diagnostic uncertainty, greater patient satisfaction, better clinical outcomes, and improvements in the use of hospital resources.⁸ Just as critical care units are designed to provide optimal care for critically ill patients, type 1 units are designed to provide the best outcomes for observation patients.

These units offer two distinct benefits to the US health system. First, they provide observation services in a setting that might result in shorter lengths-of-stay and lower costs for observation patients, compared to other settings. The savings might benefit not only hospitals but also patients, whose out-of-pocket costs could be lower. Second, the units provide a lower-cost alternative to inpatient admission for selected inpatients. The scope of these two benefits can be understood through the use of two different analyses.

In this article we examine the impact of type 1 units on the length-of-stay and cost of existing observation patients. We compared the per-

Two-thirds of US hospitals do not have an observation unit, and most observation patients in these hospitals receive care in a type 4 setting.

formance of three prototype type 1 units in Atlanta, Georgia (at hospitals described below), with the performance of a representative sample of US hospitals and with that of all hospitals in Georgia. Both of the larger groups included types 1–4 settings. We then determined the regional and national impact of type 1 units on the cost of care for a selected subgroup of inpatients, if care in a type 1 setting were used as an alternative to an inpatient admission.

Impact On Observation Visits' Length And Cost

As noted above, two-thirds of US hospitals do not have an observation unit, and most observation patients in these hospitals receive care in a type 4 setting.^{7,10} Studies of care in a type 4 setting report mean lengths-of-stay of forty-one hours for adult medical patients. As a result of these long stays, hospital costs exceed payments by an average of \$331.¹¹

Medicare claims data for 2012 show that 11 percent of observation stays were for at least three nights.⁵ Prolonged observation stays lead to poor use of costly inpatient beds; higher out-of-pocket expenses; and increased risks of hospital-acquired infections.^{5,12} Additionally, Medicare requires a patient to have been an inpatient for at least three days to receive coverage for rehabilitation in a skilled nursing facility after hospital discharge—a requirement known as the “three-night rule.” For patients admitted following observation, prolonged observation stays increase the risk of not meeting this inpatient requirement because observation is an outpatient service.

The impact of care in a type 1 setting on observation patients' lengths-of-stay and costs has not been determined.

STUDY DATA AND METHODS To examine the

impact of an observation unit on visit lengths and costs, we performed a retrospective observational cohort study of observation services using data from three distinct sources. The first was a case study of three Atlanta hospitals' type 1 observation units using 2010 clinical data. The second source was data for types 1–4 settings in Georgia from 2010 discharge data from the Healthcare Cost and Utilization Project (HCUP).¹³ The third source was data for all four settings for 2009–10 from the National Hospital Ambulatory Medical Care Survey (NHAMCS).¹⁴

Because there is no standardized way to identify type 1 units using national data, we used a case-study approach. Specifically, we compared the performance of three hospitals in Atlanta that we knew had type 1 units to the performance of all hospitals in Georgia and to the performance of a representative sample of hospitals across the United States. The regional and national comparison groups included observation patients managed in all four types of settings, although only a small number of patients were seen in type 1 units.

The Atlanta hospitals were the following: Emory University Hospital, a 587-bed tertiary care hospital (in addition to an 8-bed ED observation unit), which had 35,427 ED visits in 2010; Emory University Hospital Midtown, a 511-bed urban teaching hospital (in addition to an 8-bed ED observation unit), which had 57,236 ED visits in 2010; and Grady Memorial Hospital, a 953-bed urban public hospital (in addition to a 7-bed ED observation unit), which had 93,238 ED visits in 2010.

These hospitals' ED observation units had the key components of type 1 units described above. At each institution, patients were admitted to the observation unit after initial management of their condition in the ED had failed, using one of thirty-three condition-specific protocols for conditions such as chest pain, asthma, syncope (fainting), heart failure, and transient ischemic attack. These protocols had been developed through a process of literature review followed by interdepartmental consensus, pilot testing, and then implementation. The protocols contained clear guidelines for determining a patient's eligibility to receive observation services and how the care should proceed (for a link to the protocols, see Appendix Exhibit 2).⁹

Statewide observation services data for Georgia came from the following three HCUP databases: the Georgia State Inpatient Database, Georgia State Emergency Database, and the Georgia State Ambulatory Surgery Database (for information about these databases and how observation visits were identified see Appendix Exhibit 3).⁹ Observation stays in these

data sets were identified by the presence of an observation stay revenue code, a positive observation stay charge, or an observation stay *Current Procedural Terminology* (CPT) procedure code in the record. We selected observation service encounters including an indication that the patient had been seen in the ED. The length of an observation stay is captured in a field in HCUP records.

NHAMCS is a nationally representative sample of about 35,000 visits to 350 EDs annually.¹⁴ Observation services are delivered only to a portion of the sample because the data collection is targeted toward all ED visits, not just those involving an observation stay. Therefore, we combined data from 2009 and 2010 to improve the precision of the sample.

STUDY RESULTS During the study period there were 1.4 million annualized observation visits in the United States and 101,593 observation visits

in Georgia, excluding cases of labor and delivery diagnoses from both groups. The most common conditions are listed in Exhibit 2.¹⁴ The three Atlanta hospitals with type 1 units had 7,199 observation visits, or 7.1 percent of the cases in Georgia.

The case-mix of conditions managed with observation services was similar across the three study groups (Exhibit 2). Patients' ages were comparable across the groups, but there were more socioeconomically disadvantaged patients in the three Atlanta hospitals, as measured by the percentages of patients in the Medicaid and self-pay categories.

The three groups also differed in terms of length-of-stay (Exhibits 2 and 3), with patients in the Emory/Grady type 1 units having the shortest stays as well as a 17–44 percent lower relative probability of subsequent admission to

EXHIBIT 2

Observation Services, Patients, And Top Twelve Conditions Across Three Study Groups

| | Emory/Grady, ^a 2010 | Georgia, ^b 2010 | US, ^c 2009–10 |
|--|--------------------------------|---------------------------------------|---|
| ED visits | 185,901 | 4,194,602 | 133,957,000 |
| OBSERVATION VISITS | | | |
| Number | 7,199 | 101,593 | 1,392,000 |
| Length-of-stay | | | |
| Average (hours) ^d | 17.2 | 27.6 | 22.3 |
| Visits >24 hours | 10.4% | 44.4% | 29.0% |
| Visits >36 hours | 0.1 | 24.7 | 14.9 |
| Visits >48 hours | 0.1 | 7.2 | 6.9 |
| Visits >72 hours | 0.0 | 1.6 | 0.9 |
| Rate of inpatient admission | 13.1% | 15.8% | 23.2% |
| PATIENT CHARACTERISTICS | | | |
| Average age (years) | 52.8 | 51.6 | 47.9 |
| Percent male | 42.9% | 44.2% | 44.2% |
| Payer (%) | | | |
| Medicare | 26.5 | 37.9 | 29.8 |
| Medicaid | 11.4 | 15.1 | 26.1 |
| Self-pay or uninsured | 27.7 | 15.3 | 8.0 |
| PROTOCOL OR CLINICAL CLASSIFICATION SOFTWARE CATEGORY^e | | | |
| 1st most common condition | Chest pain | Chest pain | Abdominal pain |
| 2nd | Syncope | Syncope | Chest pain |
| 3rd | Dehydration | Fluid and electrolyte disorders | Fluid and electrolyte disorders |
| 4th | Transient ischemic attack | Appendicitis | Cardiac dysrhythmias |
| 5th | Asthma | Cardiac dysrhythmias | Other lower respiratory disease |
| 6th | Cellulitis | Abdominal pain | Syncope |
| 7th | Abdominal pain | Asthma | Conditions associated with dizziness |
| 8th | Congestive heart failure | Chronic obstructive pulmonary disease | Asthma |
| 9th | Hyperglycemia | Urinary tract infections | Headache, including migraine |
| 10th | Pyelonephritis | Pneumonia | Skin and subcutaneous tissue infections |
| 11th | Pneumonia | Congestive heart failure | Other nervous system disorders |
| 12th | Electrolyte abnormality | Biliary tract disease | Epilepsy and convulsions |

SOURCE Authors' analysis. ^aEmory/Grady data are for emergency department (ED) visits and type 1 ED observation visits at the three Atlanta hospitals described in the text. ^bGeorgia data, from the Healthcare Cost and Utilization Project, are for both ED and observation visits. ^cNational data, from the National Hospital Ambulatory Medical Care Survey, are annualized for both ED and observation visits. ^dNumber of hours beyond the eight-hour minimum length-of-stay allowed for Medicare payment for observation. The interquartile ranges are 13–21 for Emory/Grady, 23–36 for Georgia, and 11–27 for the United States. ^eEmory/Grady type 1 ED units use condition-specific protocols. For Georgia and US hospitals, Clinical Classification Software (see Note 23 in text) was used to group *International Classification of Diseases*, 9th Revision, Clinical Modification (ICD-9-CM), diagnosis codes into a smaller number of clinically meaningful categories.

the hospital as an inpatient. The most notable difference was in the percentage of patients with a prolonged observation visit. Fewer than 0.1 percent of type 1 unit patients had stays longer than forty-eight hours, compared to 7.2 percent of patients in Georgia and 6.9 percent of patients nationwide. The performance of the three Atlanta hospitals' observation units was consistent with the performance of type 1 units reported in previous studies and national surveys.^{7,15-19}

Applying the length-of-stay achieved by the Emory/Grady type 1 units to statewide data would lead to a 38 percent reduction in the length of observation visits in Georgia. Applying the type 1 unit length-of-stay to national data would lead to an estimated 23 percent reduction. Annually, this would save about 296,000 bed days nationally and \$950 million, based on costs from HCUP data.

Impact On Avoidable Inpatient Admissions

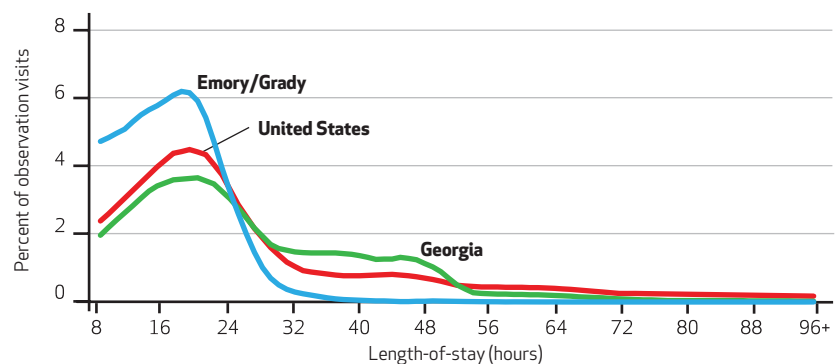
If observation services can be provided efficiently and cost-effectively in type 1 units, then those units may offer an alternative to short-stay inpatient admissions. Prior studies have estimated the reductions associated with the use of dedicated observation units in national inpatient admissions (2.4 million annually) and costs (\$3.1 billion) using Monte Carlo simulations based on NHAMCS data and inputs drawn from other studies.²⁰ HCUP captured more than 96 percent of inpatient encounters nationwide in 2010. Therefore, it serves as an intriguing data source for more precise estimates of cost savings at the national and state levels that could result from using type 1 units as a substitute for short inpatient stays.

STUDY DATA AND METHODS To examine the impact of observation units on avoidable inpatient admissions, we used the HCUP Nationwide Inpatient Sample, the largest publicly available all-payer inpatient care database in the United States. The 2010 sample contains all discharge data from 1,051 hospitals located in forty-five states, which represents approximately a 20 percent stratified sample of community hospitals. The sample includes data on total charges for each hospitalization. HCUP Cost-to-Charge Ratio Files enable the conversion between charges and estimated costs.

To estimate how many admissions might be eligible for an observation unit, we identified admissions that began in the ED and resulted in inpatient stays lasting no more than two nights.⁷ This approach is supported by data from randomized trials of observation-eligible con-

EXHIBIT 3

Observation Visit Lengths-Of-Stay Across Three Study Groups



SOURCE Authors' analysis. **NOTES** Observation visits shorter than the eight-hour minimum length-of-stay allowed for Medicare payment were excluded here. Emory/Grady data are for emergency department (ED) visits and type 1 ED observation visits, at the three Atlanta hospitals described in the text. Georgia data, from the Healthcare Cost and Utilization Project, are for both ED and observation visits. National data, from the National Hospital Ambulatory Care Survey, are annualized for both ED and observation visits from 2009-10. Other data are from 2010.

ditions showing that the length-of-stay in type 1 units is half that of inpatient settings, where median lengths-of-stay ranged from twenty-three to sixty-one hours in three different studies.²¹⁻²³

Using a time-based criterion alone might overestimate hospital admissions eligible for an observation unit. Therefore, we chose a subgroup of short-stay inpatient admissions with diagnoses that are commonly managed in an observation unit.^{7,8,10,17} This was done by screening the list of Clinical Classification Software diagnosis groups for appropriate conditions.²⁴ Eligibility for this more selective list was based on conditions reported in prior studies of observation unit conditions, conditions managed at the Atlanta hospitals we studied, published estimates of avoidable ED admissions, and our own experience.^{20,25,26}

STUDY RESULTS According to estimates based on the Nationwide Inpatient Sample data, there were more than thirty-nine million inpatient encounters in 2010. Half of those admissions began in the ED (Exhibit 4). When we used only the more selective list of eligible conditions, we found that 11.7 percent of all admissions, with a collective cost of \$20.2 billion, would be eligible for an observation unit. In Georgia, 10.0 percent of admissions, costing \$459 million, were eligible for an observation unit.

Substantial savings could be achieved through alternative management of these cases. Cost savings of care in type 1 units relative to traditional inpatient care have been reported to be in the range of 27-42 percent.⁸ Applying these percentages to the national data suggests that the use of

EXHIBIT 4

Costs Of Selected Types Of Inpatient Admissions In Georgia And The United States, 2010

| Type of admission | Georgia | | | US | | |
|--|-----------|---------|--------------------|------------|---------|--------------------|
| | Number | Percent | Cost (\$ millions) | Number | Percent | Cost (\$ millions) |
| All | 1,057,099 | 100.0 | 9,787 | 39,008,298 | 100.0 | 392,677 |
| Beginning in ED | 488,036 | 46.2 | 4,833 | 19,733,528 | 50.6 | 202,203 |
| Beginning in ED and lasting no more than 2 nights | 167,602 | 15.9 | 765 | 7,340,408 | 18.8 | 34,346 |
| Beginning in ED, lasting no more than 2 nights, only observation-eligible conditions | 106,077 | 10.0 | 459 | 4,544,836 | 11.7 | 20,229 |

SOURCE Authors' analysis. **NOTES** Georgia and national data are from the Healthcare Cost and Utilization Project. ED is emergency department.

type 1 units to replace short inpatient admissions could save \$5.5–\$8.5 billion per year.

Health Policy Issues And Implications

Widespread adoption of type 1 observation units has tremendous potential to provide cost savings to patients, hospitals, and payers. The units give ED physicians the opportunity to provide the right level of treatment to the right patient in the right setting, thereby reducing the proportion of inpatient admissions. Just as the ED has been the safety net of the health system, type 1 units are the safety net of the ED.

For many patients, type 1 units are a more cost-effective and efficient use of hospital-based health care resources than inpatient admissions. What would it take to have these units widely adopted?

First, some level of organizational redesign would be needed in the two-thirds of US hospitals that do not have the units. To incentivize such a redesign, payers would need to pay a higher rate for care provided in type 1 observation units than for care provided in any inpatient bed.

A model to consider is how ED visits are paid for. EDs are classified by Medicare as either “type A” EDs (open 24/7) or “type B” EDs (open for shorter periods of time)—designations that have been adopted nationally—and Medicare adjusts its payments to account for the round-the-clock services of “type A” EDs.²⁷

Medicare broadly classifies both observation and emergency care as outpatient “visits,” with different payment rates for each. Recognizing that the “setting” influences the level of service provided for outpatient visits, as with ED visits, payers could also require hospitals to report the setting in which observation visits occurred. For example, payers could ask hospitals to report on claim forms whether or not observation services had been provided in an observation unit and

any other part of the hospital, perhaps using the classification scheme in Exhibit 1. Payers could then incentivize the use of type 1 units by paying a higher rate for care in that setting than for care delivered elsewhere.

Second, these changes would likely increase the use of observation services, with financial consequences for Medicare patients. This is because for each outpatient service delivered, Medicare beneficiaries have a 20 percent copayment, up to the inpatient deductible amount (\$1,184 for the first sixty days of an inpatient episode in 2013), and self-administered medications are not covered. As mentioned above, prolonged observation time might jeopardize a Medicare patient's eligibility for rehabilitation in a nursing home following inpatient admission, because observation time does not help meet the inpatient “three-night rule.” These concerns have drawn attention to observation services.

For patients who cannot be released from the hospital after observation but must be admitted as inpatients and who then require rehabilitation in a skilled nursing facility, a type 1 unit is a preferable setting for care because the observation visit length-of-stay is shorter there than elsewhere. For these patients, being admitted as an inpatient sooner is better because they then spend more of their hospital time as an inpatient—thus improving their chance of meeting the “three-night rule.”

Concerns that Medicare patients have higher copayments for observation visits than for inpatient admissions have been recently been addressed.^{5,12} In 2012 Medicare observation copayments were, on average, \$324 lower than inpatient copayments, with 94 percent of observation visits having copayments that were lower than those for inpatient care. Observation remained less expensive than inpatient care when the additional cost of self-administered medications was added to inpatient costs. Furthermore, many Medicare enrollees also have supplemen-

27–42%

Cost savings

Cost saving of care in type 1 observation units relative to traditional inpatient care have been reported in the range of 27–42 percent.

Just as the ED has been the safety net of the health system, type 1 units are the safety net of the ED.

tal insurance or alternative plans that further decrease their out-of-pocket expenses. For example, Medicare Advantage plans and Medigap insurance help cover the additional Part B copayment, and many enrollees also have Part D coverage that covers the additional drug expenses.

However, there are meaningful numbers of enrollees who do not have these plans and of patients who go to a skilled nursing facility without ever qualifying for inpatient admission. For these patients, as for all observation patients, shorter stays in type 1 units are likely to have lower costs and thus lower copayments than prolonged observation stays in other settings.

Conclusion

Discussions of EDs in reference to national health care costs often focus on the high cost of avoidable ED visits, but this focus misses a much greater opportunity. Peter Smulowitz and colleagues estimated that greater savings could be achieved through avoided inpatient admissions than through avoided ED visits (1.0–2.5 percent versus 0.24–0.8 percent reductions in US health expenditures).²⁶ In a separate analysis of our data, we estimated that the cost savings from avoided inpatient admissions using type 1 units would be two to four times more than the savings from avoided ED visits (for details of this analysis, see Appendix Exhibit 4).⁹

Type 1 observation units also have benefits under current alternative payment schemes. Under bundled payment systems and in accountable care organizations, ED physicians could play a crucial role in deciding the right level of care needed to achieve high-quality outcomes while conserving resources. Type 1 units give ED physicians an appropriate option to care for the increasingly large portion of patients who are too sick to be sent home, but not sick enough to warrant inpatient care. ■

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