Teaching Hospitals Are Critical Providers of Care for Medicare Hospital Transfer Patients

Introduction
Teaching hospitals are unique in their tripartite mission of research, medical education, and patient care. Teaching hospitals have pioneered many of the fundamentals of high-quality clinical care that exist today because of their focus on this mission. One important way in which teaching hospitals continue to demonstrate their advanced capabilities and serve as indispensable resources to their communities is in treating a disproportionate share of transfer patients from other hospitals.

Transfer patients have been found to be higher acuity than average patients — they spend more time in the intensive care unit, are less likely to discharge directly to home, and ultimately cost more to treat. Teaching hospitals have demonstrated that they are uniquely able to provide specialized services or intensity of care to these patients when other hospitals are not equipped to deliver such care.

However, in the years since the AAMC last examined the care of transfer patients, there have been changes in coverage due to the Affordable Care Act, advances in technology, and changes in clinical care models. As a result, this analysis sought to understand whether teaching hospitals continue to serve as the critical providers for this complex and costly patient population in the current health care environment. Further, this analysis sought to determine whether teaching hospitals are sufficiently compensated for the additional costs of care.

Therefore, this Analysis in Brief (1) examines whether transfer patients are disproportionately sent to teaching hospitals, (2) assesses the complexity of transfer patients, and (3) determines whether teaching hospitals are sufficiently compensated for the costs they bear in treating a disproportionate share of these resource-intensive patients.

Methods
This analysis examined data for Medicare beneficiaries from the Medicare inpatient claims-level database for fiscal year 2016. Medicare beneficiaries include patients who are 65 and older, disabled, or suffering from end-stage renal disease. The database flags the patient for each case as a hospital transfer patient if they were admitted to an acute-care facility from another acute-care facility where they were an inpatient.

This case-level data was analyzed for the 3,332 hospitals in the database paid under the Inpatient Prospective Payment System (IPPS). Hospitals were classified into categories based on their association with the AAMC and their intern and resident-to-bed (IRB) ratios. Specifically, the database contained 233 current AAMC-member teaching hospitals, representing 65% of the largest teaching hospitals (those with more than 500 beds), 872 other teaching hospitals, and 2,227 nonteaching hospitals. While this report focuses on these three categories, additional categories for comparison (i.e., major and minor teaching hospitals) are included in Tables 1 and 2.

The analysis compared the observed average case mix indices (CMIs) and computed average Medicare payment-cost differences for transfer versus nontransfer cases. The CMI reflects the relative complexity, work intensity, and cost associated with the Medicare severity diagnosis-related group (MS-DRG) of each patient. To calculate the Medicare payment-cost difference, total costs were computed for each transfer and nontransfer case by grouping the charges for each case by cost center, multiplying each by their corresponding national cost-to-charge ratio, and summing the resulting cost-center-level costs. From computed total cost and reported Medicare payment, the Medicare payment-cost difference for each case was computed. To determine how the Medicare payment-cost difference per case varies by hospital teaching status and patient transfer status, a multilevel model was run on the difference to control for payment factors (i.e., the patient’s DRG weight and the hospital’s wage index, IRB ratio, and Disproportionate Share Hospital Patient Percentage (DPP)) as well as an effect of the hospital itself.

Results
In 2016, while teaching hospitals only accounted for less than one-third of all IPPS hospitals, four out of every five transfer cases were treated at teaching hospitals (Table 1). Further, AAMC-member teaching hospitals, while accounting for only 7% of all hospitals in this analysis, treated 40% percent of the transfer cases representing 13% of their inpatient case volume compared with 3% for nonteaching hospitals.

Consistent with previous findings, the average CMI for transfer cases is higher than that for nontransfer cases across each hospital category (Table 2). Further, the average CMI for transfer cases varies by hospital type. Specifically, transfer cases at
AAMC-member teaching hospitals have an average CMI of 2.58 — compared with the average CMI of 2.14 at other teaching hospitals and 2.01 at nonteaching hospitals. This is particularly significant considering that the average CMI for the nontransfer patient population at AAMC-member teaching hospitals is also high (1.99) relative to other teaching hospitals (1.73) and nonteaching hospitals (1.62).

Having confirmed that transfer cases are more complex and are disproportionately sent to AAMC-member teaching hospitals, the final step is determining whether teaching hospitals are sufficiently compensated for their critical role in caring for this patient population. Upon examination of the Medicare payment-cost differences, Medicare underpaid for all cases, both transfer and nontransfer cases (Figure 1). However, transfer cases are more severely underpaid than nontransfer cases for AAMC-member teaching hospitals and slightly more underpaid for other teaching hospitals, with the opposite being true for nonteaching hospitals. Specifically, AAMC-member teaching hospitals are underpaid by $1,669 per case through the IPPS payment system for a transfer patient compared with a nontransfer patient, after controlling for other payment factors and effect of the hospital; other teaching hospitals are underpaid by $44 per case for transfers, and nonteaching hospitals are actually underpaid more ($170) for nontransfers.

Discussion

These results have several implications. As shown in previous analyses,2,3 teaching hospitals still receive the majority of transfers, with AAMC-member teaching hospitals treating a disproportionate number of these cases. This finding demonstrates that teaching hospitals continue to play a significant role in providing specialized care to patients when other hospitals cannot and affirms their continued value as important community and regional assets.

This study confirms the prior finding2,3 that patients admitted as transfers to AAMC-member teaching hospitals fall into more complex DRGs than nontransfer patients based on their CMIs and that these transfer patients are more clinically complex than transfer patients at other types of hospitals. While the Medicare program recognizes these cases through IPPS policies (i.e., with outlier and MS-DRG payments), the costs of these resource-intensive patients are not fully covered by these payments alone.

AAMC-member teaching hospitals are underpaid by $1,669 more for transfer cases than for nontransfer cases, even after controlling for hospital- and case-specific factors that could lead to payment differences. Therefore, when taken together with the fact that AAMC-member teaching hospitals treat a disproportionate number of transfer cases, these results demonstrate the critical role that teaching hospitals play in providing specialized and intensive care to patients transferred from lower acuity settings.

A limitation of this analysis is that it focuses only on Medicare beneficiaries. However, this limitation may be considered acceptable because the Medicare database is extremely comprehensive, nationally representative of its population, and publicly available.

Regardless of the insurer of transfer cases, teaching hospitals must be mindful of challenges associated with these complex cases; remain committed to caring for these patients, whom other hospitals often cannot accommodate; and continue to provide the highest-quality care, deliver value, and control costs.
AAMC-member teaching | Other teaching | Nonteaching
---|---|---
-3,433 | -5,102 | -$2,067
-$2,111 | -$2,067 | -$743

Figure 1. Estimated average difference between Medicare payment and cost per case adjusted for case- and hospital-specific factors, 2016.

**Notes**

5. This analysis examined only cases where Medicare was the primary payer and reimbursement was greater than 0.
6. Because the database defines hospital transfer as a patient admitted from an acute care facility and because this analysis examines Medicare payments, for the sake of comparability, the pool of hospitals includes only nonfederal, short-term general hospitals paid under the same Medicare payment system.
7. IRB ratios are from the FY2019 IPPS Final Rule and Correction Notice Impact File. If the hospital did not appear on this file, the last IPPS impact file that the hospital appeared on was used.
8. Major teaching hospitals are defined as having IRB ratios of 0.25 or greater, while minor teaching hospitals have IRB ratios that fall between 0 and 0.25.
9. For more information, see glossary.
11. Medicare payment is the sum of the DRG price amount and DRG outlier approved payment amount reported in the database for each case. The DRG price amount includes the Medicare payment amount (the sum of the DRG-adjusted base payment and the disproportionate share, indirect medical education, and total Prospective Payment System capital amounts), beneficiary coinsurance liability amount, beneficiary inpatient deductible liability amount, and beneficiary blood deductible amount.
12. For more information, see glossary.
13. DPP is from the FY2019 IPPS Final Rule and Correction Notice Impact File. For more information, see glossary.

**Authors**

Brooke Kelly, research analyst, Health Care Affairs, bkelly@aamc.org
Preeti Iyer, summer intern, Health Care Affairs
Susan Xu, lead research analyst, Health Care Affairs, sxu@aamc.org

For media inquiries, visit news.aamc.org/for-the-media.

Association of American Medical Colleges
655 K Street, NW, Suite 100
Washington, DC 20001-2399
analysis@aamc.org
aamc.org/data/aib

**Examples of MS-DRGs and Their Respective Weight**

<table>
<thead>
<tr>
<th>MS-DRG</th>
<th>MS-DRG Title</th>
<th>Weight</th>
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<tbody>
<tr>
<td>007</td>
<td>Lung transplant</td>
<td>10.6510</td>
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<tr>
<td>103</td>
<td>Headaches without major complications or co-morbidities (MCC)</td>
<td>0.7814</td>
</tr>
<tr>
<td>313</td>
<td>Chest pain</td>
<td>0.7073</td>
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</tbody>
</table>

**Disproportionate Share Hospital Patient Percentage (DPP)**

Disproportionate Share Hospital Patient Percentage measures the proportion of a hospital’s patients who are dually eligible for Medicare and Medicaid and is defined by the following formula:

\[
\text{DSH Patient Percent} = \left( \frac{\text{Medicare Patient Count}}{\text{Total Patient Days}} \right) + \left( \frac{\text{Medicaid Patient Count}}{\text{Total Patient Days}} \right)
\]


**Multilevel Model**

This analysis used a multilevel model to capture both between-hospital and within-hospital effects. Specifically, the model included fixed effects of case DRG weight, hospital wage index, hospital IRB ratio, and hospital DPP, and a random
effect of hospital to capture unobserved hospital characteristics that affect case-level outcomes. The analysis merged in the hospital wage index, IRB ratio, and DPP from the FY2019 IPPS Final Rule and Correction Notice Impact File (or the most recent impact file in which the hospital appeared if they did not appear on the FY2019 file), and the case DRG weight was pulled from the FY2016 IPPS Final Rule and Correction Notice Table 5.