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The Shift to Outpatient Surgery: Geographic Variation and Site-Neutral Payments

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Executive Summary

Medicare payments to providers can vary significantly depending on the site where service is provided. A site-neutral payment policy would equalize payment for the same service irrespective of the site of service, potentially lowering Medicare expenditures. This report describes a method for identifying inpatient surgical cases that could reasonably be performed in an outpatient setting and a method for identifying equivalent outpatient surgical cases. Using equivalent inpatient and outpatient surgical categories, 2018 Medicare fee-for-service (FFS) data was analyzed to compare and measure the shift from inpatient surgery to outpatient surgery across geographic regions, and to evaluate the potential financial impact of a site-neutral inpatient/outpatient payment policy.

Inpatient care is inherently complex, especially when multiple procedures are performed during a hospital stay. This complexity and significant differences between the inpatient and outpatient procedure coding systems presented major challenges in creating equivalent categories of inpatient and outpatient procedures (referred to as Equivalent Patient Categories, or EPCs). Ultimately, 27 EPCs were created, encompassing 591,378 inpatient surgical admissions and 1,205,891 equivalent outpatient surgical visits, identifying that 32.9% of the EPC surgical volume was performed on an inpatient basis. Across EPCs, inpatient volume varied from 4.9% for laparoscopic or vaginal hysterectomy to 76.7% for initial total knee joint replacement. The New England and East North Central census regions showed the highest transition to outpatient surgery. Compared to the risk-adjusted national average at which the EPCs are performed on an inpatient basis, the EPC inpatient surgical volume across states ranged from 41.15% below expected for Vermont to 37.11% above expected for Nevada. Within states, EPC inpatient surgical volume often varied across metropolitan areas. Major teaching hospitals and hospitals with the largest disproportionate share adjustment tended to have an EPC inpatient surgical volume lower than expected, indicating a greater transition to outpatient surgery than other types of hospitals.

The analysis determined the difference between inpatient and outpatient payment for each EPC; if the 591,378 inpatient procedures had been performed as outpatient surgeries, total Medicare expenditures across the 27 EPCs would be reduced by an estimated $3.49 billion.

A central issue for the implementation of any inpatient/outpatient site-neutral procedure payment system is the clinical equivalence of the categories of inpatient/outpatient procedures included in the system. As constructed, the EPCs can provide a clinically credible basis for the implementation of an inpatient/outpatient site-neutral payment system.

Background

Medicare payments to providers can vary significantly depending on the site where service is provided. The same procedure can be performed during a hospital inpatient stay, in a hospital outpatient department (HOPD), or in an ambulatory surgery center (ASC), but with differing payment levels and impacts on beneficiary financial responsibility. Because a payment policy that is site neutral would equalize payment for the same procedure irrespective of the site of service, many policymakers view such a policy as a potentially effective means of reducing Medicare expenditures, especially for inpatient care and care provided in HOPDs or ASCs.[1] With the Medicare Hospital Insurance Trust Fund projected to be insolvent as early as 2024, there will be increasing pressure for new federal policies to control Medicare expenditures.[2]

The Bipartisan Budget Act of 2015 gave the Department of Health and Human Services (HHS) the authority to implement Medicare site-neutral payments for off-campus HOPDs and physician

offices. The 2015 legislation applied to only new off-campus HOPDs until HHS expanded site-neutral payments to all off-campus HOPDs in 2019 based on the argument that site-neutral pricing was a means of controlling the volume of services. The American Hospital Association (AHA) sued the federal government, arguing that HHS's authority to control volume did not give it authority to implement site-neutral payments for all off-campus HOPDs. The Supreme Court refused to hear the issue, allowing a lower court's ruling to stand, which permitted the expansion to all off-campus HOPDs.

The 2021 Medicare Hospital Outpatient Prospective Payment System and Ambulatory Surgical Center Payment System Final Rule phased out the inpatient-only procedure list and expanded the procedures allowed in an ASC.[3] Citing patient safety concerns, the Biden administration placed these two changes on hold,[4] while retaining the existing site-neutral payment policy for physician offices and HOPDs.

Because a payment policy that is site neutral would equalize payment for the same procedure irrespective of the site of service, many policymakers view such a policy as a potentially effective means of reducing Medicare expenditures.

As technological developments make a shift from inpatient surgery to outpatient surgery more feasible, expanding site-neutral payments beyond physician offices and HOPDs to inpatient and outpatient surgery can be an effective healthcare cost containment strategy. Site neutral payments for inpatient and outpatient surgery have previously been proposed. The Hospital Improvements for Payment (HIP) Act of 2014, for example, proposed modifying the Medicare inpatient prospective payment system (IPPS) and outpatient prospective payment system (OPPS) by establishing a new hospital site-neutral prospective payment system (SNPPS). Hospital payment under a SNPPS would have been based on a blend of the IPPS and OPPS payment amounts for patients meeting the HIP eligibility criteria. Patients not meeting the HIP eligibility criteria would remain paid under IPPS and OPPS. While HIP was deemed too aggressive at the time and not enacted, it provides insights into a potential framework for a SNPPS that encompasses procedures performed in a hospital inpatient setting, in an HOPD, or potentially in an ASC.

Objectives

This report has three primary objectives:

- Identify inpatient surgical cases that could reasonably be performed in an outpatient setting.
- Identify equivalent inpatient and outpatient surgical cases so that the shift from inpatient surgery to either an HOPD or ASC can be measured and compared across geographic regions.
- Use the equivalent inpatient and outpatient surgical categories to determine the potential financial impact of a site-neutral inpatient/outpatient payment policy.

The inherent complexity of inpatient care, especially when multiple procedures are performed during a hospital stay, and the significant differences between the inpatient and outpatient procedure coding systems present major challenges for creating equivalent categories of procedures.

Eligibility Criteria

Procedures considered eligible to be shifted from inpatient to an outpatient site of service had to meet the following criteria:

- The procedure is currently performed in both an inpatient and outpatient site of service.
- The combined inpatient and outpatient volume of the procedure is substantial.
- If performed on an inpatient basis, the procedure will cause payment to be increased.
- Equivalent procedures could be identified using the inpatient and outpatient procedure code sets.

Categories of procedures that meet these criteria are referred to as equivalent procedure categories (EPCs).

Patients considered eligible to be shifted from inpatient to an outpatient site of service were required to meet three criteria:

- For inpatients, the procedure must be clinically consistent with the reason for hospital admission.
- High severity-of-illness patients at the time of admission are excluded.
- Complex patients with multiple distinct procedures are excluded.

Patients who meet these criteria and have a procedure that meets the EPC criteria are considered eligible to be shifted from inpatient to an outpatient site of service and potentially can be included in a site-neutral inpatient/outpatient prospective payment system.

Applying the eligibility criteria to inpatients

While Medicare uses the Medicare Severity Diagnosis Related Groups (MS-DRGs) as the basis for determining inpatient hospital payment, most Medicaid hospital payment systems and many commercial hospital payment systems utilize the All Patient Refined Diagnosis Related Groups (APR DRGs).[5] This analysis utilized the APR DRGs because the methodology addresses three of the EPC and patient criteria:

Impact on inpatient payment

Patients are assigned to a higher paying APR DRG if the patient undergoes a substantial procedure. Some procedures performed in an inpatient setting, such as a diagnostic colonoscopy, are not considered substantial and therefore do not alter the DRG assignment. Procedures that impact DRG assignment are generally referred to as operating room (OR) procedures. Because the EPCs are defined from the inpatient perspective, only OR procedures are included in the EPCs.

Clinically consistent with the reason for hospital admission

Each EPC includes either all procedures in a specific surgical APR DRG or a subset of the procedures in a specific surgical APR DRG. To be assigned to a surgical APR DRG, the patient's principal diagnosis (the reason for hospital admission) must be clinically consistent with the procedure used to assign the surgical APR DRG. By using the APR DRG assignment as the starting point for defining the EPCs, the analysis excluded inpatients who did not have any procedures related to the reason for hospitalization (e.g., a patient admitted for pneumonia who develops urinary retention and requires a prostatectomy).

High severity of illness inpatients
The APR DRGs are composed of a base APR DRG that is subdivided into four severity of illness (SOI) levels (1-4) representing minor, moderate, major, and extreme severity of illness. APR DRG assignment is computed both at the time of admission and at the time of discharge. The analysis used the Present on Admission (POA) indicator field on the standard UB-04 claim form to exclude any complications and other conditions that arise after admission from the APR DRG assignment. Based on the APR DRG assigned at admission, inpatients with high severity of illness (severity levels 3 or 4) were not considered candidates for shifting a procedure to an outpatient site of service and were excluded from the analysis. In addition, some base surgical APR DRGs only apply to patients with a high-risk condition (e.g., there are two cardiac pacemaker implant base APR DRGs, one for high-risk patients admitted for acute myocardial infarctions (AMI) or other acute coronary conditions). The study excluded these base surgical APR DRGs for cases involving a high-risk condition.

The APR DRGs provide the information needed to implement these three eligibility criteria. In general, the EPCs include only specific clearly defined subgroups of procedures within an APR DRG (e.g., only the laparoscopic procedures in the prostatectomy APR DRG were included). This allowed more inpatient procedures to meet the criteria to be considered an EPC. It also made identifying the equivalent inpatient and outpatient procedures a more manageable task.

Applying the eligibility criteria to outpatients

Although Ambulatory Payment Categories (APCs) are the basis of Medicare outpatient hospital payment, many state Medicaid agencies and some commercial insurers have instituted hospital payment systems based on the Enhanced Ambulatory Patient Groups (EAPGs).[6] This analysis utilized the EAPGs because the methodology provides more detailed distinctions in payment levels. Similar to the OR designation in APR DRGs, the EAPGs designate procedures considered to be a significant outpatient procedure. The study identified equivalent outpatient EPCs that correspond to the inpatient EPCs based on the EAPG significant procedure designation. For each inpatient EPC, the corresponding outpatient significant procedures were identified to create an equivalent outpatient EPC.

Complex Patients with Multiple Procedures

Inpatient cases often have multiple distinct procedures performed during the hospital stay, making these cases more complex. Although APR DRG assignment is based on the most significant procedure performed related to the reason for hospital admission, a patient may also undergo additional, less significant procedures that are related to the reason for hospital admission, or procedures that are unrelated to the reason for hospital admission. Multiple procedures make a patient's case more complex than if a single significant procedure was performed. The APR DRGs do not separately identify patients with multiple distinct procedures, so to reasonably consider an inpatient as a candidate for outpatient surgery, this analysis designated only those inpatients who have procedures that represent a single, clinically distinct surgical intervention as eligible. For inpatients, a single, clinically distinct surgical intervention is defined as a patient who has all their OR procedures in a single EPC.

Although outpatient surgery is generally performed for a single distinct procedure, some outpatient cases do have multiple distinct procedures. For outpatients, a single, clinically distinct surgical intervention is defined as a patient who has all their EAPG significant procedures in a single EPC.

While identifying inpatients and outpatients with a single distinct procedure appears straight-forward, substantial differences between the inpatient and outpatient procedure coding systems

make it difficult to identify a single distinct procedure and develop equivalent inpatient and outpatient procedure categories.

Procedure Coding Systems

Hospital inpatient procedures are reported using the 10th Revision of the International Classification of Diseases Procedure Coding System (ICD-10-PCS). Outpatient procedures are reported using Current Procedural Terminology (CPT) from the American Medical Association. ICD-10-PCS and CPT are structurally very different coding systems. ICD-10-PCS uses standard definitions throughout the classification system for specifying the site of the procedure, the technique used to reach the site of the procedure and the underlying objective of the procedure. It does not include any diagnosis information in the classification. In contrast, CPT is a procedure terminology whose goal is to fully describe all aspects of a procedure in a single code. As a result, the codes are highly variable in the amount and kinds of information they contain, including, in many cases, information about the diagnosis for which the procedure was performed.

The significant differences between the inpatient and outpatient procedure coding systems presented major challenges in creating equivalent categories of inpatient and outpatient procedures.

The significant structural differences between the two coding systems present challenges when it comes to assigning codes for procedures commonly performed at the same time. For example, CPT has a single code for a hysterectomy performed along with common auxiliary procedures such as removal of fallopian tubes and ovaries. However, in ICD-10-PCS, each distinct component of a "combination" procedure is coded separately. For a hysterectomy, three separate codes are required to specify the removal of the uterus, the tubes and the ovaries because they represent three separate procedure sites.

As noted, a single distinct procedure can be defined as an inpatient with all OR procedures in a single EPC and as an outpatient with all significant procedures in a single EPC. Operationally, however, the structural difference between the two coding systems requires an exception to this general approach for procedures commonly performed at the same time. Procedures considered auxiliary to the procedures that comprise the EPC should not cause a patient to be excluded from an EPC. In the EPC for a laparoscopic hysterectomy, for example, a case that includes ICD-10-PCS codes for removal of the tubes and ovaries should remain assigned to the EPC for laparoscopic hysterectomy.

Although separate coding of a procedure's auxiliary parts is primarily an inpatient ICD-10-PCS coding issue, it can also be an issue for outpatient CPT coding. In the case of the EPC for PTCA (percutaneous transluminal coronary angioplasty), for example, the insertion of a stent is included in the relevant ICD-10-PCS codes, but in CPT the stent insertion is assigned as an additional auxiliary code. As shown in Table 1, coding of auxiliary parts of the same procedure can be very different in the two coding systems. For the EPC *Open Cervical Spinal Fusion, One or More Vertebral Segments*, a disc excision, the release of a spinal nerve and bone graft harvesting are separately coded auxiliary parts of the cervical spinal fusion in ICD-10-PCS, but in CPT each additional vertebral segment, the insertion of a stabilization device and bone graft harvesting are separately coded auxiliary parts. Although the procedures considered auxiliary may differ between the two coding systems, this report handled auxiliary procedures the same way for CPT and ICD-10-PCS and did not exclude a patient from being assigned to an EPC.

Table 1: Constituent part example for EPC for Open Cervical Spinal Fusion, One Or More Vertebral Segments

	ICD-10-PCS	CPT
Multiple Segments	Specified in SNPC primary code	Constituent part code for each additional segment
Stabilization Device	Specified in SNPC primary code	Constituent part code
Excision of Disc	Constituent part code	Bundled in SNPC primary code
Release of Nerve	Constituent part code	Bundled in SNPC primary code
Harvest Bone Graft	Constituent part code	Constituent part code

Multiple procedures and auxiliary parts of a procedure are highly interrelated issues. Cases with multiple distinct procedures were excluded for every EPC unless the additional procedures were auxiliary to the procedures in the EPC. The exclusion decision-making process was made more difficult by ICD-10-PCS and CPT coding rules that specified whether additional procedures are bundled or coded separately. For example, the analysis did not create an EPC for the initial insertion of a cardiac defibrillator because the CPT code was for an "implant or replacement." Defining the EPC as an implant or replacement of a defibrillator meant that all the codes associated with the removal of all the components of a previously inserted defibrillator had to be allowed as auxiliary parts of a defibrillator implant or replacement. Because a pacemaker can be removed and replaced with a defibrillator, the pacemaker removal had to be allowed as an auxiliary part of a defibrillator implant or replacement. Intestinal adhesiolysis and lymph node excisions are typically bundled (not coded separately) in CPT, but coded separately in ICD-10-PCS, necessitating that they be considered auxiliary procedures in many EPCs. Effectively dealing with the multiple procedures and auxiliary procedures is essential for establishing equivalent inpatient and outpatient EPCs.

Implications for Equivalent Inpatient/Outpatient Site-neutral Payments

Because a site-neutral payment system would pay an equivalent amount whether the procedure is performed in an inpatient or outpatient setting, failure to include an equivalent mix of patients in the inpatient and outpatient EPCs could lead to unfair payment biases. As shown in Table 2, inpatients who experience revascularization of the leg may also have an endovascular repair of the abdominal aorta or a toe or foot amputation. However, virtually no outpatients undergoing a revascularization of the leg have an endovascular repair of the abdominal aorta or a toe or foot amputation. Thus, to create an equivalent inpatient and outpatient revascularization of the leg EPC, any patients with multiple distinct procedures must be excluded (i.e., in this example, any patients who also have an endovascular repair of abdominal aorta or a toe or foot amputation). Failure to exclude such patients from the EPC for leg revascularization would create an unfair site-neutral payment bias against revascularization of a leg artery performed as an inpatient (i.e., underpayment for revascularization of leg inpatients).

Table 2: Multiple procedure example

Subgroup	Count Inpatient	Count Outpatient
APR DRG 182 SOI 1, 2	43,001	
EPC: Revascularization of Leg	16,699	75,590
• With endovascular repair of abdominal aorta	1,410	0
• With toe or foot amputation	1,351	199

Development of the EPCs

Starting with inpatient procedures that impacted APR DRG assignment, the study identified EPCs that had substantial inpatient and outpatient volume and could be defined in both ICD-10-PCS and CPT coding systems. Table 3 contains the 27 EPCs that were created. For each EPC, auxiliary inpatient and outpatient procedures were identified, meeting the criteria that a single distinct procedure is implemented for each EPC. Appendix A contains the APR DRGs associated with each of the EPCs.

Table 3: 27 EPCs included in the analysis

Equivalent Patient Categories (EPCs)	
Open Discectomy and/or Decompression Laminectomy	Open Tibia or Fibula Fracture Reduction With/Without Internal Fixation
Open Cervical Spinal Fusion, One or More Vertebral Segments	Open Treatment of Shoulder Dislocation or Humerus Fracture
Abdominal Hernia Repair	Toe Amputation
Inguinal or Femoral Hernia Repair	Bunionectomy Without Implant or Fusion
Defibrillator System Implant or Replacement	Cystourethroscopy With Removal of Ureteral Calculus
Pacemaker System Implant or Replacement	Laparoscopic/Percutaneous Removal of Kidney Calculus
Percutaneous Transluminal Coronary Angioplasty	Laparoscopic or Endoscopic Kidney Excision and Ablation
Percutaneous Cardiac Ablation	Laparoscopic Prostatectomy
Cardiac Catherization	Transurethral Resection of Prostate
Revascularization of Leg Artery	Laparoscopic or Vaginal Hysterectomy
Laparoscopic Cholecystectomy	Mastectomy
Laparoscopic Appendectomy	Open Resection of Lymph Nodes of Neck
Initial Total Knee Joint Replacement	Thyroidectomy
Partial Knee Joint Replacement	

Expected Values and Financial Impact

A national EPC norm was calculated by computing the ratio of the inpatient admission volume divided by the sum of the inpatient admission volume and outpatient visit volume in each EPC. The expected value (E) for a geographic region or hospital (risk adjusted for the mix of EPCs) is computed as the sum of its inpatient admission volume and outpatient visit volume in each EPC multiplied by the national EPC norm value for each EPC and summed over all EPCs (indirect rate standardization). The actual value (A) for a geographic region or hospital is its actual inpatient admission volume in each EPC summed over all EPCs. The difference between the actual value (A) and the expected value (E) in a geographic region or hospital represents a greater transition to outpatient surgery if (A-E) is negative (A<E) and less of a transition to outpatient surgery if (A-E) is positive (A>E). %(A-E)/E is the percent by which the actual inpatient admission volume is lower than expected (when %(A-E)/E is negative) or higher than expected (when %(A-E)/E is positive).

APR DRGs and EAPGs have available a standard set of relative payment weights. For each of the 27 EPCs, the APR DRG relative weight for each inpatient surgery was multiplied by the average inpatient payment to determine the estimated average inpatient payment for the EPC. For each of the 27 EPCs, the EAPG relative weight for each outpatient surgery was multiplied by the average outpatient payment to determine the estimated average outpatient payment for the EPC. For each EPC, the difference between the average inpatient estimated payment and average estimated outpatient payment was multiplied by the inpatient volume in the EPC to determine the estimated reduction in payments if all inpatient procedures were performed as outpatient surgery.

Data

The data used in this report are from the Medicare Standard Analytic Files (Limited Data Set (LDS)) for calendar year 2018. The data was limited to 3,247 hospitals that are paid on an FFS basis under the Medicare Inpatient Prospective Payment System (IPPS). There were 1,454,035 hospital admissions with a procedure performed from one of the 27 EPCs. 284,970 (19.6%) of those admissions were patients with an admission APR DRG severity of illness of 3 or 4 and were excluded as candidates to be shifted to an outpatient site of service, leaving 1,169,065 eligible inpatient hospital admissions. There were 1,409,707 hospital outpatient visits that had one of the 27 EPCs performed.

As shown in Table 4, 534,371 (45.7%) of the inpatient hospital admissions had procedures performed in a single EPC. Including admissions that also had an auxiliary procedure increased the number of admissions by 57,007 (10.7%) to 591,378. Of the hospital outpatient visits, 1,142,276 (81.0%) had procedures performed in a single EPC. Including outpatient visits that also had an auxiliary procedure increased the number of outpatient visits by 63,624 (5.6%) to 1,205,891. As expected, a much greater proportion of inpatients had multiple distinct procedures performed (49.4%) compared to outpatient visits (14.5%), and auxiliary procedures occurred more frequently for inpatients due to ICD-10-PCS coding rules. For the 27 EPCs, 32.9% of the overall inpatient and outpatient volume is inpatient.

Table 4: Patients with multiple procedures excluded from the analysis

	Inpatient (Severity of Illness 1, 2)	HOPD
Patients w procedure in an EPC	1,169,065	1,409,707
Patients w procedures in a single EPC	534,371 (45.7%)	1,142,267 (81.0%)
Patients w procedures in a single EPC + constituent part procedures	57,007 (10.7%)	63,624 (5.6%)
Count EPCs	591,378	1,205,891

The data used in this report also included the LDS carrier file that contains Medicare FFS claims data for professional providers, including ambulatory surgery centers (ASCs), for a random sample of 5% of Medicare beneficiaries. The LDS carrier file was used to examine ASC volume in the 27 EPCs.

Percent Inpatient by EPC

As shown in Table 5, the percent inpatient varies by EPC. Some EPCs have largely shifted to an outpatient site of service, with a low percent of the EPC performed as an inpatient, such as:

- 4.9% for *Laparoscopic or Vaginal Hysterectomy*
- 6.0% for *Inguinal or Femoral Hernia Repair*

Other EPCs continue to be primarily inpatient, with a high percentage of the EPC performed as an inpatient, such as:

- 76.7% *Initial Total Knee Joint Replacement*
- 72.4% *Laparoscopic/Percutaneous Removal of Kidney Calculus*

With such a wide variation in the percent inpatient across EPCs, a comparison of the percent of procedures performed on an inpatient basis across different populations must be risk adjusted for the mix of EPCs in the populations.

Table 5: Percent inpatient for the 27 EPCs

EPC	Inpatient EPC	Outpatient EPC	Percent Inpatient
Open Discectomy and/or Decompression Laminectomy	22,760	57,521	28.4
Open Cervical Spinal Fusion, One or More Vertebral Segments	25,718	16,407	61.1
Abdominal Hernia Repair	13,985	46,195	23.2
Inguinal or Femoral Hernia Repair	5,121	80,705	6.0
Defibrillator System Implant or Replacement	6,958	29,041	19.3
Pacemaker System Implant or Replacement	39,514	50,229	44.0
Percutaneous Transluminal Coronary Angioplasty	40,877	19,373	67.8
Percutaneous Cardiac Ablation	11,696	70,749	14.2
Cardiac Catherization	77,086	411,292	15.8
Revascularization of Leg Artery	11,858	71,510	14.2
Laparoscopic Cholecystectomy	34,809	51,201	40.5
Laparoscopic Appendectomy	3,949	10,460	27.4
Initial Total Knee Joint Replacement	229,087	69,770	76.7
Partial Knee Joint Replacement	10,457	10,730	49.4
Open Tibia or Fibula Fracture Reduction With/Without Internal Fixation	14,828	8,228	64.3
Open Treatment of Shoulder Dislocation or Humerus Fracture	5,932	5,519	51.8
Toe Amputation	6,643	9,998	39.9
Bunionectomy Without Implant or Fusion	1,193	7,745	13.3
Cystourethroscopy With Removal of Ureteral Calculus	6,763	64,073	9.5
Laparoscopic/Percutaneous Removal of Kidney Calculus	2,897	1,107	72.4
Laparoscopic or Endoscopic Kidney Excision and Ablation	3,322	3,405	49.4
Laparoscopic Prostatectomy	2,785	8,684	24.3
Transurethral Resection of the Prostate	6,272	49,522	11.2
Laparoscopic or Vaginal Hysterectomy	956	18,581	4.9
Mastectomy	3,124	16,863	15.6
Open Resection of Lymph Nodes of Neck	1,104	3,345	24.8
Thyroidectomy	1,684	13,638	11.0
Total	591,378	1,205,891	32.9

Geographic variation in the percent inpatient

Table 6 contains the %(A-E)/E for the percent inpatient in the nine census regions using the national percent inpatient norm in Table 5. The New England and East North Central census regions show the greatest transition to outpatient surgery, with inpatient volume at 13.58% and 11.22% below expected, respectively. The South Atlantic and Middle Atlantic regions have experienced the lowest transition to outpatient surgery with inpatient volume at 7.08% and 6.55% above expected, respectively.

Table 6: %(A-E)/E for the 27 EPCs by census region

Census Regions	States	Hospitals	Inpatient EPC	Outpatient EPC	Percent Inpatient	%(A-E)/E
New England	ME, VT, NH, CT, MA, RI	131	30,639	82,860	27.0	-13.58
Middle Atlantic	NY, NJ, PA	356	76,295	144,732	34.5	6.55
South Atlantic	FL, GA, SC, NC, VA, WV, DC, MD, DE	564	127,505	232,109	35.5	7.08
East North Central	IL, WI. MI, IN. OH	498	89,381	229,424	28.0	-11.22
East South Central	KY, TN, AL, MS	296	42,703	86,118	33.1	1.79
West South Central	TX, OK, AR, LA	518	68,335	126,641	35.0	4.91
West North Central	MN, IA, MO, KS, NE, SD, ND	254	55,264	108,379	33.8	-1.86
Mountain	AZ, NM, UT, CO, NV, WY, ID, MT	233	39,028	70,288	35.7	1.04
Pacific	CA, OR, WA, HI, AK	397	60,666	124,555	32.8	-0.51

Table 7 contains the %(A-E)/E by state for the percent inpatient using the national percent inpatient norm in Table 5. The states range from 41.15% below expected for Vermont to 37.11% above expected for Nevada. Consistent with the census region results, the northeastern states tend to be consistently below the expected percent inpatient.

The New England and East North Central census regions show the greatest transition to outpatient surgery, with inpatient volume at 13.58% and 11.22% below expected, respectively. The South Atlantic and Middle Atlantic regions have experienced the lowest transition to outpatient surgery with inpatient volume at 7.08% and 6.55% above expected, respectively.

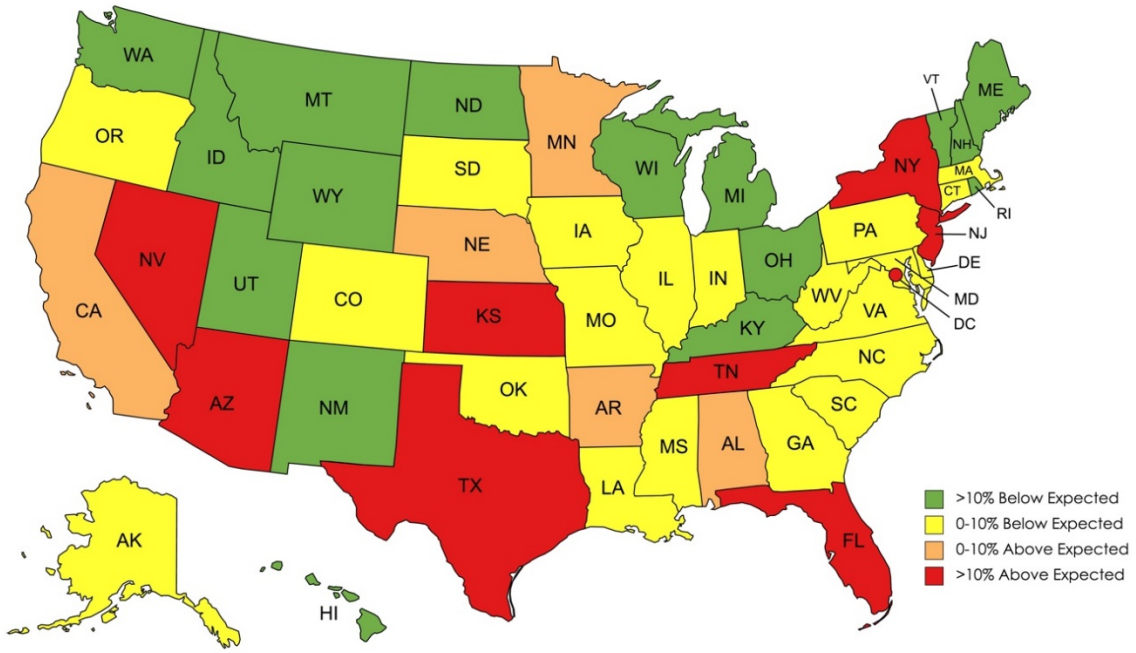
Table 7: %(A-E)/E for the 27 EPCs by state

States	Hospitals	Inpatient EPC	Outpatient EPC	Percent Inpatient	%(A-E)/E
Alabama	83	11,397	20,243	36.0	7.40
Alaska	8	1,060	2,172	32.8	-1.51
Arizona	61	11,927	15,967	42.8	16.76
Arkansas	45	8,542	17,285	33.1	2.56
California	294	42,478	79,506	34.8	4.86
Colorado	49	8,744	15,470	36.1	-0.30
Connecticut	29	6,276	13,260	32.1	-1.66
Delaware	6	3,069	6,322	32.7	-6.30
DC	7	1,663	2,977	35.8	14.31
Florida	166	45,924	55,234	45.4	30.63
Georgia	100	13,628	32,530	29.5	-4.54
Hawaii	12	933	2,726	25.5	-17.90
Idaho	16	3,165	8,222	27.8	-17.04
Illinois	126	24,738	60,778	28.9	-8.39
Indiana	85	14,549	31,916	31.3	-3.18
Iowa	34	7,072	14,543	32.7	-4.82
Kansas	51	9,345	12,047	43.7	14.98
Kentucky	64	8,726	23,557	27.0	-11.31
Louisiana	88	8,875	22,479	28.3	-8.98
Maine	17	2,478	10,330	19.3	-33.21
Maryland	47	9,808	19,651	33.3	-2.61
Massachusetts	55	16,312	40,307	28.8	-9.67
Michigan	93	18,950	51,853	26.8	-13.91
Minnesota	49	14,640	26,644	35.5	1.95
Mississippi	60	6,934	17,287	28.6	-7.69
Missouri	72	13,443	31,477	29.9	-7.40
Montana	14	2,498	7,324	25.4	-21.24
Nebraska	23	5,135	9,053	36.2	1.07
Nevada	21	4,382	4,428	49.7	37.11
New Hampshire	13	3,008	10,083	23.0	-21.31
New Jersey	64	16,751	27,090	38.2	15.54
New Mexico	31	2,999	7,867	27.6	-14.86
New York	145	33,035	56,679	36.8	13.18
North Carolina	83	19,738	42,271	31.8	-2.34
North Dakota	7	1,967	7,276	21.3	-31.66
Ohio	129	21,836	58,141	27.3	-13.32
Oklahoma	83	10,545	22,356	32.1	-4.10
Oregon	34	5,668	13,242	30.0	-9.09
Pennsylvania	147	26,509	60,963	30.3	-5.04
Rhode Island	11	1,588	4,109	27.9	-12.69
South Carolina	54	10,420	22,911	31.3	-3.47
South Dakota	18	3,662	7,339	33.3	-6.48
Tennessee	89	15,646	25,031	38.5	11.84
Texas	302	40,373	64,521	38.5	11.95
Utah	31	4,525	8,982	33.5	-10.17
Vermont	6	977	4,771	17.0	-41.15
Virginia	72	18,374	37,556	32.9	-0.87
Washington	49	10,527	26,909	28.1	-12.43
West Virginia	29	4,881	12,657	27.8	-7.96
Wisconsin	65	9,308	26,736	25.8	-18.67
Wyoming	10	788	2,028	28.0	-12.22

Figure 1 is a U.S. map with the states color coded as follows:

Green:	%(A-E)/E >10% below expected – 16 states
Yellow:	%(A-E)/E 0-10% below expected – 21 states
Orange:	%(A-E)/E 0-10% above expected – 5 states
Red:	%(A-E)/E >10% above expected – 9 states

Figure 1: %(A-E)/E State



Using the metropolitan areas identified in the Core Based Statistical Areas (CBSAs) obtained from the Office of Management and Budget (OMB), Appendix B contains the %(A-E)/E for each of the CBSAs that include three or more hospitals. Some CBSAs encompass multiple states. For example, the Philadelphia metropolitan area encompasses parts of New Jersey, Delaware and Maryland. When a CBSA encompasses more than one state, the CBSA in Appendix B is assigned to the primary state associated with the CBSA (e.g., the Philadelphia metropolitan area was assigned to Pennsylvania). Appendix B shows the significant variation in the percent inpatient across CBSAs within a state. Table 8 shows the difference in the shift to outpatient surgery between two major California population corridors. In the Los Angeles to San Diego corridor, the percent inpatient is consistently above expected, while the percent inpatient is consistently below expected in the San Francisco to Sacramento area.

Table 8: %(A-E)/E by major CBSAs in northern and southern California

CBSAs	Hospitals	Percent Inpatient	%(A-E)/E
California	294	34.8	4.86
Northern			
San Francisco-San Mateo-Redwood City	17	26.0	-14.82
Oakland-Berkeley-Livermore	18	33.6	-1.45
Sacramento-Roseville-Folsom	15	27.7	-10.13
San Jose-Sunnyvale-Santa Clara	10	25.6	-15.52
Southern			
Los Angeles-Long Beach-Glendale	67	41.4	24.03
Anaheim-Santa Ana-Irvine	23	37.7	21.13
San Diego-Chula Vista-Carlsbad	13	39.5	20.18
Riverside-San Bernardino-Ontario	30	33.3	5.27
Bakersfield	7	37.7	15.71

Variation in percent inpatient by type of hospital

Table 9 contains the %(A-E)/E for the percent inpatient for the following hospital types:

- teaching status
- proportion of low-income patients
- location
- bed size

Table 9: %(A-E)/E by type of hospital

		Hospitals	Inpatient EPC	Outpatient EPC	Percent Inpatient	%(A-E)/E
IME	Top 10%	328	258,514	98,401	27.6	-8.08
	All Other	2,919	946,592	491,415	34.2	1.79
DSH	DSH Top 20%	648	193,364	79,916	29.2	-3.39
	DSH Mid 60%	1,951	851,677	394,171	31.6	-2.01
	DSH Bot 20%	648	160,065	115,729	42.0	10.41
Location	Large Urban	1,273	433,287	250,985	36.7	9.00
	Other Urban	887	373,250	186,594	33.3	-0.07
	Rural	1,087	398,569	152,237	27.6	-11.91
Size	Top 10%	329	370,927	178,624	32.5	3.07
	All Other	2,918	834,179	411,192	33.0	-1.28

Major teaching hospitals (the 10% of hospitals with the largest IPPS Indirect Medical Education (IME) payment adjustment) and hospitals with the largest IPPS Disproportionate Share Hospital

(DSH) payment adjustment have a percent inpatient 8.08% and 3.39% lower than expected, respectively. Rural hospitals have a percent inpatient 11.91% lower than expected. Non-teaching hospitals, hospitals with the smallest DSH payment adjustment and large hospitals have a percent inpatient 1.79%, 10.41% and 3.07% higher than expected, respectively.

Financial Impact

The analysis used the average inpatient payment of $12,196 and average outpatient payment of $730 to convert the APR DRG and EAPG relative weights to dollars and to determine the difference between inpatient and outpatient payment for each EPC. This difference was multiplied by the inpatient volume in the EPC to determine the estimated reduction in payments if the 591,378 inpatient procedures were performed as outpatient procedures. The estimated total reduction in payments across the 27 EPCs is $3.49 billion ($5,902 per inpatient surgery).

Appendix C contains the estimated reduction in payments for each of the EPCs. The EPC for *Initial Total Knee Joint Replacement* had the largest reduction in estimated payments at $1.1 billion. Many of the procedures that are being shifted to an outpatient setting are orthopedic and endovascular procedures. However, many orthopedic and endovascular procedures are currently on the inpatient-only list. Table 10 contains several examples of potential EPCs that are not included in the analysis because they are primarily composed of procedures on the inpatient-only list with virtually no outpatient volume. If these procedures were removed from the inpatient only list and shifted to outpatient, Medicare would realize an estimated reduction in payments of $2.3 billion for these five EPCs.

Table 10: Examples of EPCs that are primarily inpatient

EPC	Inpatient EPC	Outpatient EPC	Percent Inpatient	$ Impact (000,000)
Lumbar Spinal Fusion Open (Single)	42,150	435	99.0	685.5
Percutaneous Carotid Artery Stent Procedures	7,308	336	95.6	91.6
Initial Total Hip Joint Replacement	164,295	389	99.8	824.9
Initial Total Shoulder Joint Replacement	57,458	1,480	97.5	404.6
Partial Hip Joint Replacement	60,674	2	100.0	305.5
Total	331,885	2,642	99.2	2,312.2

ASC Volume in the 27 EPCs

In the 5% carrier file, there were 36,600 severity 1 or 2 inpatient admissions with procedures in a single EPC with or without an auxiliary procedure, and there were 3,645 ASC visits with procedures in a single EPC with or without an auxiliary procedure. For the 27 EPCs, overall inpatient and ASC volume that is inpatient totals 91.1% (as compared to 42.0% for HOPDs in the five percent sample). Appendix D contains the ASC volume by EPC. The addition of the ASC volume to the HOPD volume would reduce the percent inpatient from 42.0 to 40.3%. Adding the ASC volume would have the greatest impact on the percent inpatient for the EPCs *Bunionectomy Without Implant or Fusion* and *Toe Amputation*. Because the ASC volume in the 27 EPCs is relatively low, the unavailability of ASC data for the overall analysis of the 27 EPCs had minimal impact on the results.

Discussion

Any proposal to implement site-neutral payments for inpatient and outpatient surgery will likely be met with resistance and intense scrutiny primarily related to the clinical equivalence of patients included in the inpatient and outpatient surgical categories. Hospital leaders will argue that their facilities are required to provide 24/7 care to all types of patients, including vulnerable populations, and contend that this requirement is not explicitly funded but instead supported by higher revenue levels from direct patient care, thereby making inpatient payment levels not comparable to other sites of service. As a result, hospitals will likely resist any site-neutral payment system based on the contention that it could unfairly disadvantage inpatient care. For example, in an adjunction to its lawsuit against the expansion of site-neutral payments to all off-campus HOPDs, the AHA conducted a study, which argued that patients seen in an HOPD are more complex than patients seen in a physician office.[7]

If hospital leaders oppose the implementation of an inpatient/outpatient site-neutral payment system and make the clinical equivalence of procedure categories the central issue of their opposition, then the issues of patient severity of illness, multiple procedures and auxiliary procedures will likely have to be addressed in determining eligibility for any inpatient/outpatient site-neutral payment system proposal. The development of the EPCs illustrates how those issues can be effectively addressed.

The study's outcomes reflect the shift from inpatient to outpatient surgery in 2018. Since this shift continues to accelerate, current data would likely show a smaller percentage of the 27 EPCs performed on a hospital inpatient basis. The analysis was limited to the shift from inpatient to hospital outpatient for those procedures that impacted DRG assignment and therefore had the greatest influence on payment, with the difference between current inpatient and outpatient payment levels used to estimate the potential reduction in payments. A site-neutral payment policy is likely to be based on some blending of the current inpatient and outpatient payment levels, thereby lowering the estimated reduction in payments.

The study calculated the difference between inpatient and outpatient payment for each EPC and found if the 591,378 inpatient procedures were performed as outpatient surgery, Medicare would achieve an estimated total reduction in payments of $3.49 billion across the 27 EPCs.

Summary and Conclusions

The inherent complexity of inpatient care, especially when a hospital stay involves multiple procedures, and the significant differences between the inpatient and outpatient procedure coding systems presented major challenges for creating equivalent categories of inpatient and outpatient procedures. The 27 EPCs, encompassing 591,378 inpatient surgical admissions and 1,205,891 equivalent outpatient surgical visits, identified 32.9% of the EPC surgical volume performed on an inpatient basis. Across the EPCs, inpatient volume varied from 4.9% for laparoscopic or vaginal hysterectomy to 76.7% for initial total knee joint replacement. The New England and East North Central census regions showed the highest transition to outpatient surgery. Compared to the

national rates at which the EPCs are performed on an inpatient basis, the EPC inpatient surgical volume across states ranged from 41.15% below expected for Vermont to 37.11% above expected for Nevada. Within each state, EPC inpatient surgical volume often varied between metropolitan areas. Major teaching hospitals and hospitals with the largest disproportionate share adjustment tended to have an EPC inpatient surgical volume lower than expected, indicating a greater transition to outpatient surgery.

The study calculated the difference between inpatient and outpatient payment for each EPC and found if the 591,378 inpatient procedures were performed as outpatient surgery, Medicare would achieve an estimated total reduction in payments of $3.49 billion across the 27 EPCs. Any implementation of a site-neutral payment policy would equalize payment for the same service irrespective of the site of service and potentially reduce Medicare expenditures. A central issue, however, will be the clinical equivalence of the procedure categories included in the system. The EPCs as constructed can provide a clinically credible basis for the implementation of an inpatient/outpatient site-neutral payment system.

References

[1] Committee for a Responsible Federal Budget. (2021, July 22). Equalizing Medicare payments regardless of site-of-care. https://www.crfb.org/papers/equalizing-medicare-payments-regardless-site-care.

[2] Congressional Budget Office. (2020, September 2). The Outlook for Major Federal Trust Funds: 2020 to 2030. https://www.cbo.gov/publication/56541.

[3] Centers for Medicare & Medicaid Services. (2020, December 2). Fact sheet: CY 2021 Medicare Hospital Outpatient Prospective Payment System and Ambulatory Surgical Center Payment System Final Rule (CMS-1736-FC). https://www.cms.gov/newsroom/fact-sheets/cy-2021-medicare-hospital-outpatient-prospective-payment-system-and-ambulatory-surgical-center-0

[4] Centers for Medicare & Medicaid Services (2021, July 19). CY 2022 Medicare Hospital Outpatient Prospective Payment System and Ambulatory Surgical Center Payment System Proposed Rule (CMS-1753-P). https://www.cms.gov/newsroom/fact-sheets/cy-2022-medicare-hospital-outpatient-prospective-payment-system-and-ambulatory-surgical-center

[5] Goldfield, N, McCullough, E, Hughes, J, Tang, A, Eastman, B, Rawlins, L, Averill, R, "Identifying Potentially Preventable Readmissions", Health Care Financing Review, Vol. 30, No.1, Fall, 2008 pp. 75-91.

[6] Goldfield N, Averill R, Eisenhandler J, Grant T. Ambulatory Patient Groups, Version 3.0—a classification system for payment of ambulatory visits. Journal of Ambulatory Care Management. 2008;31(1):2-16. doi:10.1097/01. JAC.0000304091.21087.08.

[7] American Hospital Association. (2021, April). Report: Comparison of Care in Hospital Outpatient Departments and Independent Physician Offices. https://www.aha.org/guidesreports/2021-04-14-comparison-care-hospital-outpatient-departments-and-independent-physician

Appendix A: APR DRGs in the 27 EPCs

EPC	APR DRG	Description
OPEN DISCECTOMY AND/OR DECOMPRESSION LAMINECTOMY	023	SPINAL PROCEDURES
	310	INTERVERTEBRAL DISC EXCISION & DECOMPRESSION
	320	OTHER MUSCULOSKELETAL SYSTEM & CONNECTIVE TISSUE PROCEDURES
OPEN CERVICAL SPINAL FUSION, ONE OR MORE VERTEBRAL SEGMENTS	321	CERVICAL SPINAL FUSION & OTHER BACK/NECK PROC EXC DISC EXCIS/DECOMP
LUMBAR SPINAL FUSION OPEN (SINGLE)	304	DORSAL & LUMBAR FUSION PROC EXCEPT FOR CURVATURE OF BACK
ABDOMINAL HERNIA REPAIR	227	HERNIA PROCEDURES EXCEPT INGUINAL, FEMORAL & UMBILICAL
INGUINAL OR FEMORAL HERNIA REPAIR	228	INGUINAL, FEMORAL & UMBILICAL HERNIA PROCEDURES
DEFIBRILLATOR SYSTEM IMPLANT OR REPLACEMENT	179	DEFIBRILLATOR IMPLANTS
PACEMAKER SYSTEM IMPLANT OR REPLACEMENT	171	PERM CARDIAC PACEMAKER IMPLANT W/O AMI, HEART FAILURE OR SHOCK
PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY	175	PERCUTANEOUS CARDIAC INTERVENTION W/O AMI
PERCUTANEOUS CARDIAC ABLATION	175	PERCUTANEOUS CARDIAC INTERVENTION W/O AMI
CARDIAC CATHERIZATION	191	CARDIAC CATHETERIZATION FOR CORONARY ARTERY DISEASE
	192	CARDIAC CATHETERIZATION FOR OTHER NON-CORONARY CONDITIONS
REVASCULARIZATION OF LEG ARTERY	182	OTHER PERIPHERAL VASCULAR PROCEDURES
PERCUTANEOUS CAROTID ARTERY STENT PROCEDURES	030	PERCUTANEOUS INTRA & EXTRACRANIAL VASCULAR PROCEDURES
	180	OTHER CIRCULATORY SYSTEM PROCEDURES
LAPAROSCOPIC CHOLECYSTECTOMY	263	CHOLECYSTECTOMY
LAPAROSCOPIC APPENDECTOMY	234	APPENDECTOMY WITHOUT COMPLEX PRINCIPAL DIAGNOSIS
INITIAL TOTAL HIP JOINT REPLACEMENT	301	HIP JOINT REPLACEMENT
INITIAL TOTAL KNEE JOINT REPLACEMENT	302	KNEE JOINT REPLACEMENT
INITIAL TOTAL SHOULDER JOINT REPLACEMENT	322	SHOULDER & ELBOW JOINT REPLACEMENT
PARTIAL HIP JOINT REPLACEMENT	301	HIP JOINT REPLACEMENT
PARTIAL KNEE JOINT REPLACEMENT	302	KNEE JOINT REPLACEMENT
OPEN TIBIA OR FIBULA FRACTURE REDUCTION W/WO INTERNAL FIXATION DEVICE	313	KNEE & LOWER LEG PROCEDURES EXCEPT FOOT
OPEN TREATMENT OF SHOULDER DISLOCATION OR HUMERUS FRACTURE	315	SHOULDER, UPPER ARM & FOREARM PROCEDURES EXCEPT JOINT REPLACEMENT
TOE AMPUTATION	314	FOOT & TOE PROCEDURES
BUNIONECTOMY WO IMPLANT OR FUSION	314	FOOT & TOE PROCEDURES
CYSTOURETHROSCOPY WITH REMOVAL OF URETERAL CALCULUS	446	URETHRAL & TRANSURETHRAL PROCEDURES

EPC	APR DRG	Description
LAPAROSCOPIC/PERCUTANEOUS REMOVAL OF KIDNEY CALCULUS	443	KIDNEY & URINARY TRACT PROCEDURES FOR NONMALIGNANCY
LAPAROSCOPIC OR ENDOSCOPIC KIDNEY EXCISION AND ABLATION	442	KIDNEY & URINARY TRACT PROCEDURES FOR MALIGNANCY
	443	KIDNEY & URINARY TRACT PROCEDURES FOR NONMALIGNANCY
LAPAROSCOPIC PROSTATECTOMY	484	OTHER MALE REPRODUCTIVE SYSTEM & RELATED PROCEDURES
TRANSURETHRAL RESECTION OF PROSTATE	482	TRANSURETHRAL PROSTATECTOMY
LAPAROSCOPIC OR VAGINAL HYSTERECTOMY	511	UTERINE & ADNEXA PROCEDURES FOR OVARIAN & ADNEXAL MALIGNANCY
	512	UTERINE & ADNEXA PROCEDURES FOR NON-OVARIAN & NON-ADNEXAL MALIG
	513	UTERINE & ADNEXA PROCEDURES FOR NON-MALIGNANCY EXCEPT LEIOMYOMA
MASTECTOMY	362	MASTECTOMY PROCEDURES
OPEN RESECTION OF LYMPH NODES OF NECK	091	OTHER MAJOR HEAD & NECK PROCEDURES
	681	OTHER O.R. PROCEDURES FOR LYMPHATIC/HEMATOPOIETIC/OTHER NEOPLASMS
THYROIDECTOMY	404	THYROID, PARATHYROID & THYROGLOSSAL PROCEDURES

Appendix B: %(A-E)/E by CBSA With at Least Three Hospitals

State	CBSA Name	Hospitals	Inpatient	Outpatient	Percent Inpatient	%(A-E)/E
Alabama	Birmingham-Hoover, AL	13	2,636	4,527	0.3680	10.92
Alabama	Montgomery, AL	5	429	1,048	0.2905	-9.72
Alabama	Mobile, AL	4	1,125	1,065	0.5137	41.07
Alabama	Anniston-Oxford, AL	3	72	133	0.3512	6.87
Alabama	Daphne-Fairhope-Foley, AL	3	498	638	0.4384	20.52
Alabama	Huntsville, AL	3	1,749	2,919	0.3747	9.32
Alabama	Tuscaloosa, AL	3	691	1,102	0.3854	15.55
Arizona	Phoenix-Mesa-Chandler, AZ	26	4,670	3,523	0.5700	32.98
Arizona	Lake Havasu City-Kingman, AZ	3	273	944	0.2243	-23.63
Arizona	Tucson, AZ	3	442	723	0.3794	-4.85
Arkansas	Little Rock-North Little Rock-Conway, AR	11	3,612	6,409	0.3604	9.26
Arkansas	Fayetteville-Springdale-Rogers, AR	5	1,435	1,602	0.4725	32.89
Arkansas	Hot Springs, AR	4	515	996	0.3408	2.67
Arkansas	Fort Smith, AR-OK	3	318	717	0.3072	7.97
California	Los Angeles-Long Beach-Glendale, CA	67	6,345	8,986	0.4139	24.03
California	Riverside-San Bernardino-Ontario, CA	30	3,407	6,838	0.3326	5.27
California	Anaheim-Santa Ana-Irvine, CA	23	2,989	3,533	0.4583	21.13
California	Oakland-Berkeley-Livermore, CA	18	2,037	4,027	0.3359	-1.45
California	San Francisco-San Mateo-Redwood City, CA	17	2,046	5,832	0.2597	-14.82
California	Sacramento-Roseville-Folsom, CA	15	2,634	6,885	0.2767	-10.13
California	San Diego-Chula Vista-Carlsbad, CA	13	3,031	4,637	0.3953	20.18
California	San Jose-Sunnyvale-Santa Clara, CA	10	1,781	5,167	0.2563	-15.52
California	Bakersfield, CA	7	699	1,153	0.3774	15.71
California	Fresno, CA	6	1,417	1,526	0.4815	29.64
California	Oxnard-Thousand Oaks-Ventura, CA	6	1,079	1,849	0.3685	5.99
California	Santa Rosa-Petaluma, CA	6	398	646	0.3812	-2.52
California	Stockton, CA	6	717	1,028	0.4109	4.62
California	Modesto, CA	5	993	1,398	0.4153	23.70
California	Vallejo, CA	4	329	443	0.4262	24.64
California	Redding, CA	3	761	542	0.5840	40.54
California	Salinas, CA	3	541	1,134	0.3230	4.29
California	San Luis Obispo-Paso Robles, CA	3	469	683	0.4071	8.14
California	San Rafael, CA	3	308	887	0.2577	-16.92
California	Santa Cruz-Watsonville, CA	3	327	455	0.4182	23.42
California	Santa Maria-Santa Barbara, CA	3	593	1,176	0.3352	-9.54
California	Visalia, CA	3	585	1,040	0.3600	6.17
Colorado	Denver-Aurora-Lakewood, CO	19	3,631	5,526	0.3965	8.84
Colorado	Boulder, CO	4	414	1,215	0.2541	-20.59
Colorado	Fort Collins, CO	4	1,281	1,857	0.4082	3.19
Connecticut	Hartford-East Hartford-Middletown, CT	8	1,191	2,667	0.3087	-1.06
Connecticut	Bridgeport-Stamford-Norwalk, CT	6	1,741	3,632	0.3240	-2.99
Connecticut	New Haven-Milford, CT	6	937	1,373	0.4056	3.51
Delaware	Wilmington, DE-MD-NJ	5	2,189	3,725	0.3701	0.75
District of Columbia	Washington-Arlington-Alexandria, DC-VA-MD-WV	31	6,546	9,971	0.3963	14.59
Florida	Tampa-St. Petersburg-Clearwater, FL	27	6,086	6,209	0.4950	44.18
Florida	Miami-Miami Beach-Kendall, FL	16	1,560	1,949	0.4446	41.64

State	CBSA Name	Hospitals	Inpatient	Outpatient	Percent Inpatient	%(A-E)/E
Florida	Fort Lauderdale-Pompano Beach-Sunrise, FL	14	2,559	3,810	0.4018	18.32
Florida	West Palm Beach-Boca Raton-Boynton Beach, FL	12	3,706	4,010	0.4803	43.92
Florida	Orlando-Kissimmee-Sanford, FL	11	5,463	4,960	0.5241	44.52
Florida	Jacksonville, FL	10	3,908	5,183	0.4299	21.47
Florida	North Port-Sarasota-Bradenton, FL	7	3,287	3,913	0.4565	26.41
Florida	Palm Bay-Melbourne-Titusville, FL	7	1,449	2,329	0.3835	15.06
Florida	Crestview-Fort Walton Beach-Destin, FL	5	681	897	0.4316	27.18
Florida	Deltona-Daytona Beach-Ormond Beach, FL	5	1,063	1,467	0.4202	17.28
Florida	Pensacola-Ferry Pass-Brent, FL	5	1,249	3,519	0.2620	-12.65
Florida	Cape Coral-Fort Myers, FL	4	1,697	2,374	0.4169	20.08
Florida	Gainesville, FL	3	1,485	1,792	0.4532	32.45
Florida	Panama City, FL	3	690	851	0.4478	31.02
Florida	Port St. Lucie, FL	3	1,684	1,752	0.4901	39.98
Florida	Punta Gorda, FL	3	869	490	0.6394	49.25
Georgia	Atlanta-Sandy Springs-Alpharetta, GA	35	5,512	13,600	0.2884	-5.12
Georgia	Augusta-Richmond County, GA-SC	6	1,157	2,955	0.2814	-10.58
Georgia	Columbus, GA-AL	4	926	1,602	0.3663	-5.14
Georgia	Macon-Bibb County, GA	3	922	1,064	0.4642	47.05
Georgia	Rome, GA	3	745	857	0.4650	41.80
Georgia	Savannah, GA	3	858	1,334	0.3914	9.19
Georgia	Warner Robins, GA	3	281	701	0.2862	-1.68
Hawaii	Urban Honolulu, HI	7	769	2,152	0.2633	-14.69
Idaho	Boise City, ID	4	1,181	3,624	0.2458	-25.63
Illinois	Chicago-Naperville-Arlington Heights, IL	52	11,203	26,374	0.2981	-6.24
Illinois	Lake County-Kenosha County, IL-WI	7	1,420	2,350	0.3767	6.57
Illinois	Elgin, IL	6	1,151	2,051	0.3595	7.74
Illinois	Peoria, IL	3	252	1,195	0.1742	-36.12
Illinois	Rockford, IL	3	819	2,054	0.2851	-12.26
Indiana	Indianapolis-Carmel-Anderson, IN	25	4,702	9,715	0.3261	-1.30
Indiana	Gary, IN	11	1,689	4,253	0.2842	0.20
Indiana	Fort Wayne, IN	8	1,377	2,297	0.3748	7.45
Indiana	Evansville, IN-KY	5	1,586	2,781	0.3632	5.80
Indiana	South Bend-Mishawaka, IN-MI	4	852	991	0.4623	13.12
Iowa	Des Moines-West Des Moines, IA	5	1,998	2,093	0.4884	24.09
Iowa	Davenport-Moline-Rock Island, IA-IL	4	1,279	1,670	0.4337	8.61
Iowa	Waterloo-Cedar Falls, IA	3	390	1,506	0.2057	-30.70
Kansas	Wichita, KS	9	2,653	1,809	0.5946	38.92
Kentucky	Louisville/Jefferson County, KY-IN	10	3,103	5,286	0.3699	10.93
Kentucky	Lexington-Fayette, KY	7	1,031	2,826	0.2673	-8.99
Louisiana	New Orleans-Metairie, LA	18	1,978	5,449	0.2663	-12.72
Louisiana	Lafayette, LA	11	1,563	2,746	0.3627	8.30
Louisiana	Baton Rouge, LA	7	856	2,483	0.2564	-19.90
Louisiana	Shreveport-Bossier City, LA	7	1,169	3,311	0.2609	-15.76
Louisiana	Monroe, LA	5	661	1,225	0.3505	17.16
Louisiana	Alexandria, LA	3	907	1,105	0.4508	30.63
Louisiana	Houma-Thibodaux, LA	3	190	802	0.1915	-37.36
Louisiana	Lake Charles, LA	3	128	475	0.2123	-27.60
Maine	Portland-South Portland, ME	5	1,230	4,482	0.2153	-28.11
Maryland	Baltimore-Columbia-Towson, MD	23	5,642	11,827	0.3230	-3.70

State	CBSA Name	Hospitals	Inpatient	Outpatient	Percent Inpatient	%(A-E)/E
Maryland	Silver Spring-Frederick-Rockville, MD	7	1,841	1,952	0.4854	21.09
Maryland	Salisbury, MD-DE	6	1,320	4,071	0.2449	-22.25
Massachusetts	Boston, MA	16	6,791	12,300	0.3557	3.54
Massachusetts	Cambridge-Newton-Framingham, MA	14	2,826	7,858	0.2645	-16.94
Massachusetts	Worcester, MA-CT	7	720	2,368	0.2332	-21.98
Massachusetts	Springfield, MA	5	355	1,556	0.1858	-36.23
Michigan	Warren-Troy-Farmington Hills, MI	17	2,376	5,035	0.3206	-4.77
Michigan	Detroit-Dearborn-Livonia, MI	8	1,168	1,786	0.3954	15.27
Michigan	Grand Rapids-Kentwood, MI	6	554	1,958	0.2205	-30.31
Michigan	Ann Arbor, MI	4	1,324	5,686	0.1889	-34.50
Michigan	Flint, MI	3	901	1,151	0.4391	24.91
Michigan	Kalamazoo-Portage, MI	3	759	2,590	0.2266	-22.62
Michigan	Lansing-East Lansing, MI	3	1,050	3,073	0.2547	-13.05
Minnesota	Minneapolis-St. Paul-Bloomington, MN-WI	26	9,007	12,868	0.4117	13.27
Minnesota	Duluth, MN-WI	4	715	2,596	0.2159	-24.44
Mississippi	Jackson, MS	10	2,015	3,712	0.3518	2.45
Mississippi	Gulfport-Biloxi, MS	5	1,070	3,180	0.2518	-17.37
Missouri	Kansas City, MO-KS	29	5,453	8,922	0.3793	10.65
Missouri	St. Louis, MO-IL	29	6,038	12,734	0.3216	-2.01
Nebraska	Omaha-Council Bluffs, NE-IA	12	2,457	5,266	0.3181	-8.63
Nebraska	Lincoln, NE	4	1,369	1,026	0.5716	44.30
Nevada	Las Vegas-Henderson-Paradise, NV	14	3,034	1,637	0.6495	61.90
Nevada	Reno, NV	4	920	1,770	0.3420	8.48
New Hampshire	Manchester-Nashua, NH	5	1,542	4,274	0.2651	-11.26
New Hampshire	Rockingham County-Strafford County, NH	4	529	1,637	0.2442	-19.61
New Jersey	Newark, NJ-PA	16	4,080	6,945	0.3701	13.37
New Jersey	Camden, NJ	8	2,920	3,682	0.4423	31.05
New Jersey	Trenton-Princeton, NJ	4	526	814	0.3925	17.06
New Mexico	Albuquerque, NM	5	1,365	2,146	0.3888	5.27
New York	New York-Jersey City-White Plains, NY-NJ	70	15,281	24,932	0.3800	17.19
New York	Nassau County-Suffolk County, NY	19	8,005	7,450	0.5180	49.22
New York	Buffalo-Cheektowaga, NY	9	1,537	2,611	0.3705	10.36
New York	Rochester, NY	8	870	2,370	0.2685	-15.66
New York	Albany-Schenectady-Troy, NY	7	1,374	3,103	0.3069	-1.67
New York	Syracuse, NY	5	1,505	2,067	0.4213	20.86
New York	Dutchess County-Putnam County, NY	3	795	1,268	0.3854	9.02
New York	Utica-Rome, NY	3	381	1,159	0.2474	-7.81
North Carolina	Charlotte-Concord-Gastonia, NC-SC	18	4,568	9,893	0.3159	-5.91
North Carolina	Durham-Chapel Hill, NC	6	1,670	5,005	0.2502	-18.01
North Carolina	Raleigh-Cary, NC	6	2,272	3,680	0.3817	11.41
North Carolina	Winston-Salem, NC	6	1,373	4,407	0.2375	-20.92
North Carolina	Asheville, NC	3	544	2,241	0.1953	-37.83
North Carolina	Hickory-Lenoir-Morganton, NC	3	289	1,205	0.1934	-31.21
North Carolina	Rocky Mount, NC	3	260	822	0.2403	-21.17
Ohio	Cleveland-Elyria, OH	22	4,893	14,703	0.2497	-18.32
Ohio	Cincinnati, OH-KY-IN	18	4,315	9,904	0.3035	-7.05
Ohio	Columbus, OH	16	3,862	6,845	0.3607	5.97
Ohio	Toledo, OH	8	1,067	2,222	0.3244	-2.12
Ohio	Youngstown-Warren-Boardman, OH-PA	8	651	1,520	0.2999	-12.48

State	CBSA Name	Hospitals	Inpatient	Outpatient	Percent Inpatient	%(A-E)/E
Ohio	Dayton-Kettering, OH	6	424	1,377	0.2354	-21.33
Ohio	Akron, OH	4	953	1,498	0.3888	1.54
Ohio	Lima, OH	3	686	1,211	0.3616	14.61
Oklahoma	Oklahoma City, OK	23	4,696	9,636	0.3277	-3.97
Oklahoma	Tulsa, OK	14	2,463	2,380	0.5086	23.58
Oregon	Portland-Vancouver-Hillsboro, OR-WA	17	2,997	6,622	0.3116	-4.48
Oregon	Eugene-Springfield, OR	3	1,062	667	0.6142	43.93
Oregon	Salem, OR	3	408	711	0.3646	-0.45
Pennsylvania	Pittsburgh, PA	28	4,060	7,349	0.3559	7.31
Pennsylvania	Montgomery County-Bucks County-Chester County, PA	20	4,595	7,106	0.3927	10.20
Pennsylvania	Philadelphia, PA	17	4,340	9,535	0.3128	2.75
Pennsylvania	Allentown-Bethlehem-Easton, PA-NJ	10	1,357	3,861	0.2601	-17.02
Pennsylvania	Lancaster, PA	4	1,139	2,783	0.2904	-9.81
Pennsylvania	York-Hanover, PA	4	860	2,183	0.2826	-10.17
Pennsylvania	Bloomsburg-Berwick, PA	3	412	2,486	0.1422	-48.22
Pennsylvania	Scranton--Wilkes-Barre, PA	3	240	750	0.2424	-22.58
Rhode Island	Providence-Warwick, RI-MA	15	2,771	7,322	0.2745	-12.42
South Carolina	Greenville-Anderson, SC	8	2,058	4,133	0.3324	-1.38
South Carolina	Charleston-North Charleston, SC	6	2,091	3,855	0.3517	7.88
South Carolina	Florence, SC	5	621	1,516	0.2906	-1.31
South Carolina	Columbia, SC	4	927	2,381	0.2802	-13.58
South Carolina	Myrtle Beach-Conway-North Myrtle Beach, SC-NC	4	1,411	1,981	0.4160	14.02
South Carolina	Spartanburg, SC	4	557	1,888	0.2278	-25.03
South Dakota	Sioux Falls, SD	4	1,831	3,617	0.3361	-1.27
Tennessee	Nashville-Davidson--Murfreesboro--Franklin, TN	19	5,069	6,364	0.4434	21.37
Tennessee	Memphis, TN-MS-AR	11	2,670	4,811	0.3569	9.98
Tennessee	Knoxville, TN	6	1,513	1,773	0.4604	16.01
Tennessee	Chattanooga, TN-GA	4	1,832	2,439	0.4289	22.93
Tennessee	Johnson City, TN	3	99	310	0.2421	-13.36
Tennessee	Kingsport-Bristol, TN-VA	3	177	654	0.2130	-25.49
Tennessee	Morristown, TN	3	134	344	0.2803	-17.12
Texas	Houston-The Woodlands-Sugar Land, TX	54	6,850	12,123	0.3610	11.04
Texas	Dallas-Plano-Irving, TX	52	6,268	7,304	0.4618	24.72
Texas	Fort Worth-Arlington-Grapevine, TX	30	3,182	3,746	0.4593	29.07
Texas	Austin-Round Rock-Georgetown, TX	19	3,048	4,189	0.4212	22.95
Texas	San Antonio-New Braunfels, TX	14	3,942	2,228	0.6389	51.74
Texas	El Paso, TX	8	777	848	0.4782	35.24
Texas	Tyler, TX	5	1,606	3,778	0.2983	-8.71
Texas	Brownsville-Harlingen, TX	4	786	535	0.5950	40.05
Texas	Lubbock, TX	4	1,292	1,640	0.4407	14.56
Texas	McAllen-Edinburg-Mission, TX	4	500	1,643	0.2333	-21.88
Texas	Abilene, TX	3	752	1,185	0.3882	10.58
Texas	College Station-Bryan, TX	3	365	1,045	0.2589	-18.16
Texas	Corpus Christi, TX	3	711	387	0.6475	56.20
Texas	Killeen-Temple, TX	3	954	4,404	0.1781	-38.08
Texas	Longview, TX	3	560	1,235	0.3120	-5.80
Texas	Sherman-Denison, TX	3	539	631	0.4607	23.38
Utah	Salt Lake City, UT	11	1,935	4,378	0.3065	-14.00
Utah	Ogden-Clearfield, UT	6	799	1,425	0.3593	-9.49
Utah	Provo-Orem, UT	5	583	612	0.4879	18.07

State	CBSA Name	Hospitals	Inpatient	Outpatient	Percent Inpatient	%(A-E)/E
Virginia	Virginia Beach-Norfolk-Newport News, VA-NC	14	4,718	10,603	0.3079	-6.80
Virginia	Richmond, VA	9	3,742	5,415	0.4086	18.23
Virginia	Roanoke, VA	3	1,265	2,290	0.3558	5.35
Washington	Seattle-Bellevue-Kent, WA	17	3,844	9,087	0.2973	-10.42
Washington	Tacoma-Lakewood, WA	5	1,097	3,190	0.2559	-15.53
Washington	Spokane-Spokane Valley, WA	4	1,024	1,450	0.4139	19.46
Washington	Yakima, WA	3	340	1,163	0.2262	-21.99
West Virginia	Huntington-Ashland, WV-KY-OH	5	1,174	3,840	0.2341	-19.23
West Virginia	Wheeling, WV-OH	5	351	1,361	0.2050	-26.06
West Virginia	Charleston, WV	4	1,297	2,400	0.3508	12.12
Wisconsin	Milwaukee-Waukesha, WI	15	1,930	3,718	0.3417	-8.06
Wisconsin	Madison, WI	5	1,622	4,501	0.2649	-15.48
Wisconsin	Eau Claire, WI	3	418	293	0.5879	26.15
Wisconsin	Green Bay, WI	3	363	1,059	0.2553	-19.24
Wisconsin	Oshkosh-Neenah, WI	3	128	606	0.1744	-44.76

Appendix C: Potential Reduction in Expenditures by EPC

EPC	Inpatient EPC	Outpatient EPC	$ Impact (000,000)
OPEN DISCECTOMY AND/OR DECOMPRESSION LAMINECTOMY	22,760	57,521	71.0
OPEN CERVICAL SPINAL FUSION, ONE OR MORE VERTEBRAL SEGMENTS	25,718	16,407	137.9
ABDOMINAL HERNIA REPAIR	13,985	46,195	113.1
INGUINAL OR FEMORAL HERNIA REPAIR	5,121	80,705	29.1
DEFIBRILLATOR SYSTEM IMPLANT OR REPLACEMENT	6,958	29,041	65.7
PACEMAKER SYSTEM IMPLANT OR REPLACEMENT	39,514	50,229	260.0
PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY	40,877	19,373	347.0
PERCUTANEOUS CARDIAC ABLATION	11,696	70,749	27.1
CARDIAC CATHERIZATION	77,086	411,292	513.4
REVASCULARIZATION OF LEG ARTERY	11,858	71,510	103.1
LAPAROSCOPIC CHOLECYSTECTOMY	34,809	51,201	274.6
LAPAROSCOPIC APPENDECTOMY	3,949	10,460	15.3
INITIAL TOTAL KNEE JOINT REPLACEMENT	229,087	69,770	1083.0
PARTIAL KNEE JOINT REPLACEMENT	10,457	10,730	51.0
OPEN TIBIA OR FIBULA FRACTURE REDUCTION W/WO INTERNAL FIXATION	14,828	8,228	115.5
OPEN TREATMENT OF SHOULDER DISLOCATION OR HUMERUS FRACTURE	5,932	5,519	45.2
TOE AMPUTATION	6,643	9,998	56.7
BUNIONECTOMY WO IMPLANT OR FUSION	1,193	7,745	7.0
CYSTOURETHROSCOPY WITH REMOVAL OF URETERAL CALCULUS	6,763	64,073	32.2
LAPAROSCOPIC/PERCUTANEOUS REMOVAL OF KIDNEY CALCULUS	2,897	1,107	22.0
LAPAROSCOPIC OR ENDOSCOPIC KIDNEY EXCISION AND ABLATION	3,322	3,405	30.4
LAPAROSCOPIC PROSTATECTOMY	2,785	8,684	12.1
TRANSURETHRAL RESECTION OF PROSTATE	6,272	49,522	26.3
LAPAROSCOPIC OR VAGINAL HYSTERECTOMY	956	18,581	3.6
MASTECTOMY	3,124	16,863	26.2
OPEN RESECTION OF LYMPH NODES OF NECK	1,104	3,345	12.4
THYROIDECTOMY	1,684	13,638	9.7
TOTAL	591,378	1,205,891	3,490.6

Appendix D: ASC Volume by EPC

EPC	Inpatient EPC	Outpatient EPC	ASC EPC	% Inpatient without ASC	% Inpatient with ASC
OPEN DISCECTOMY AND/OR DECOMPRESSION LAMINECTOMY	855	2,444	333	25.9	23.5
OPEN CERVICAL SPINAL FUSION, ONE OR MORE VERTEBRAL SEGMENTS	1,031	686	41	60.0	58.6
ABDOMINAL HERNIA REPAIR	552	1,831	277	23.2	20.8
INGUINAL OR FEMORAL HERNIA REPAIR	210	3,459	611	5.7	4.9
DEFIBRILLATOR SYSTEM IMPLANT OR REPLACEMENT	284	1,214	42	19.0	18.4
PACEMAKER SYSTEM IMPLANT OR REPLACEMENT	1,708	2,288	87	42.7	41.8
PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY	1,620	836	1	66.0	65.9
PERCUTANEOUS CARDIAC ABLATION	491	2,987	1	14.1	14.1
CARDIAC CATHERIZATION	3,034	17,211	15	15.0	15.0
REVASCULARIZATION OF LEG ARTERY	465	2,894	10	13.8	13.8
LAPAROSCOPIC CHOLECYSTECTOMY	1,374	2,116	170	39.4	37.5
LAPAROSCOPIC APPENDECTOMY	144	410	2	26.0	25.9
INITIAL TOTAL KNEE JOINT REPLACEMENT	9,088	2,832	36	76.2	76.0
PARTIAL KNEE JOINT REPLACEMENT	380	419	113	47.6	41.7
OPEN TIBIA OR FIBULA FRACTURE REDUCTION W/WO INTERNAL FIXATION DEVICE	590	347	93	63.0	57.3
OPEN TREATMENT OF SHOULDER DISLOCATION OR HUMERUS FRACTURE	233	209	30	52.7	49.4
TOE AMPUTATION	240	417	199	36.5	28.0
BUNIONECTOMY WO IMPLANT OR FUSION	53	289	522	15.5	6.1
CYSTOURETHROSCOPY WITH REMOVAL OF URETERAL CALCULUS	253	2,700	518	8.6	7.3
LAPAROSCOPIC/PERCUTANEOUS REMOVAL OF KIDNEY CALCULUS	128	46	5	73.6	71.5
LAPAROSCOPIC OR ENDOSCOPIC KIDNEY EXCISION AND ABLATION	132	145	47	47.7	40.7
LAPAROSCOPIC PROSTATECTOMY	86	358	0	19.4	19.4
TRANSURETHRAL RESECTION OF PROSTATE	233	2,184	301	9.6	8.6
LAPAROSCOPIC OR VAGINAL HYSTERECTOMY	38	711	14	5.1	5.0
MASTECTOMY	109	722	27	13.1	12.7
OPEN RESECTION OF LYMPH NODES OF NECK	47	154	61	23.4	17.9
THYROIDECTOMY	64	531	48	10.8	10.0
TOTAL	23,442	50,440	3,604	31.7	30.3

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