

Supplementary Online Content

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eAppendix. Methods and Results

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eTable 2. Use and Associated Spending of Services Detected by Low-Value Service Measures, by Category

eReferences

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix : Methods and Results

Measures of Low-Value Services

Services were screened for measure appropriateness from the sources listed in the paper's methods section according to the following criteria: (1) the service must apply to the general Medicare population; (2) appropriate use of the service (if present) must be plausibly distinguishable from wasteful use using procedural and diagnostic codes from the date of service, site of care, beneficiary demographic information, and chronic condition indicators; (3) the evidence base establishing the low-value of the service must have existed prior to 2009. The feasibility denoted by the second criterion was determined by the physicians on our research team. For some services (e.g., imaging for pulmonary embolism without moderate or high pre-test probability), there was an obvious lack of clinical information in claims necessary to define the low-value scenario (e.g., pre-test probability of pulmonary embolism depends in part on heart rate and physical exam findings not recorded in claims). For other services, we inspected a small random sample of claims detected by preliminary measure algorithms to determine if cases of potentially appropriate use could be systematically excluded. The adequacy of information on symptoms in particular determined the inclusion or exclusion of many candidate services. For example, to identify cardiac stress tests for low-risk, asymptomatic patients would require excluding cases with a wide range of symptoms, including non-specific symptoms (e.g., nausea and diaphoresis), as well as cases with risk factors present that may not be captured in claims (e.g., smoking status, family history, dyslipidemia). In contrast, symptoms of carotid artery disease are more circumscribed as they relate directly to transient ischemic attacks and strokes; thus, we could more confidently exclude appropriate use in developing a measure of screening for asymptomatic carotid artery disease. Similarly, the cardiac stress testing measure we did

include in our analysis (for adults with stable coronary disease) depended only on site of service and prior diagnoses, not symptoms, in order to assess appropriateness. We applied the second criterion more leniently when defining more sensitive versions of each measure (e.g. relaxing from USPSTF D recommendation criteria to C criteria).

A primary finding of our study was that the amount of low-value spending detected by our measures varied widely between more sensitive and more specific versions of our measures. For a service to be included in our study, we required that a more specific version – one that convincingly excluded most if not all cases of appropriate use – could be developed. The difference in spending between sensitive and specific versions, however, was not factored into the measure inclusion decision. Indeed, for some services (e.g., vertebroplasty), the sensitive version was quite specific and vice-versa, with little difference in detected utilization between the two. After the final measures had been developed, the six measure categories (low-value cancer screening, etc.) were defined based on service type and measures were assigned to these categories.

In order to ensure that measures detected their target services across clinical settings, measures were developed from both the 2009 Carrier and Outpatient Research Identifiable Files (RIFs). Services provided in hospital outpatient departments or by hospital-employed providers appear either in the Outpatient RIF alone or in both the Outpatient and Carrier RIF, whereas physician and ancillary services provided in inpatient settings or in non-hospital outpatient settings appear in the Carrier RIF. In both files, claims chronicle services using Current Procedural Terminology codes and document accompanying diagnoses using ICD-9 codes. Additional demographic information necessary for measure development (i.e. age and sex) was obtained from the 2009 enrollment (denominator) file, and summary spending totals and

conditions from the Chronic Condition Warehouse (CCW) were obtained from the Beneficiary Annual Summary File. Together, these variables served as the basis for measure development. Because CPT codes are revised annually, appropriate CPT codes were selected based on their definitions as of January 1, 2009. For the development of some measurement algorithms, we also employed the Berenson-Eggers Type of Service (BETOS) coding system for identifying CPT codes in broader clinical categories.

In order to assess for the presence of chronic conditions as of the service date, we employed CCW variables specifying each relevant condition's date of first occurrence. Additional past diagnoses were assessed using ICD-9 codes present in the 2008 and 2009 Carrier and Outpatient RIFs. When measure restriction criteria required assessment of whether certain services preceded or followed a service of interest (e.g. whether a surgical procedure followed a chest x-ray), the relevant preceding or following service was detected using CPT or BETOS codes in the 2008 and 2009 Carrier and Outpatient RIFs. Column two of eTable 1 lists all relevant CPT, ICD-9 and BETOS codes used for service detection. Emergency department visits were detected according to methods described in a prior study.¹ Inpatient stays were identified based on the presence of claims in the 2008 and 2009 Medicare Provider and Analysis Review (MedPAR) files.

For all measures, standardized prices were calculated as the median of total allowed charges for relevant services. Allowed charges included payments from Medicare, beneficiaries, and any other payers. For the majority of measures, relevant services were defined to include both the main detected service and specific services frequently delivered as a part of the detected service (e.g. venipuncture with PSA screening). These additional services were included in spending calculations if they occurred on the day of the detected low-value service. We

conservatively excluded codes for evaluation and management services (i.e. office visits) from relevant services because they could have occurred even in the absence of the detected service.

Two alternate approaches to defining relevant services were employed for surgical procedures whose complex billing precluded a comprehensive specification of relevant CPT codes. For surgical procedures sometimes occurring in the outpatient setting (renal artery angioplasty or stenting, vertebroplasty/kyphoplasty, and arthroscopic knee surgery), we isolated encounters that appeared in both the Carrier and Outpatient files and totaled all allowed institutional and professional spending that occurred on the day of the detected service across the two files. We examined the most common CPT codes employed on the day of these operations and did not observe any services being delivered that were obviously unrelated to the service of interest. Pricing based on inpatient prospective payments (diagnosis-related groups or DRGs) was avoided when possible because such payments cover a wide array of services that may not be related to the service of interest. However, this approach was necessary for surgical procedures that occurred almost exclusively in the inpatient setting (i.e. carotid endarterectomy and PCI). For these services, prices were determined based on the sum of all spending for services that occurred on the day of the detected services as well as the spending permitted by the DRG for the inpatient stay, obtained from the MedPAR file. In order to limit the inclusion of spending on unrelated services, we restricted the pricing sample to instances where the detected service was the only procedure listed in the MedPAR stay or where the assigned DRG for the admission corresponded to the detected service. All additional codes used in the pricing of relevant services are listed in column three of eTable 1.

Multiple prices were calculated for measures encompassing multiple services with substantially varied prices. For example, colon cancer screening prices were calculated

separately for fecal occult blood testing and other colon cancer screening modalities, and prices for stress testing were calculated separately for exercise treadmill tests with electrocardiographic monitoring and for tests involving advanced imaging modalities.

In order to avoid counting a single service multiple times in frequency or spending calculations, we did not count any detected services that was recorded as having occurred within seven days of the same type of detected service for each beneficiary.

Primary Analysis

Utilization rates and associated spending for services detected by low-value care measures, presented graphically in Figure 2, are presented in tabular form in eTable S2.

Several variables included in our regression analyses merit additional explanation. In order to account for case mix, we included an extensive set of patient characteristics in regressions. These included indicators for 21 CCW diagnoses present before 2009 (derived from claims dating back to 1999) and indicators of having multiple comorbid conditions (2 to 7+). In addition to these variables, we developed indicators for demographic characteristics and clinical conditions qualifying beneficiaries for potential receipt of low-value services, listed in column 4 of eTable 1. Although these indicators “qualify” beneficiaries for the receipt of services, the indicators do not imply that the receipt of services is appropriate. Instead, the indicators highlight those patients whose characteristics make them eligible to receive a low-value service. For instance, because our measure of low-value PSA testing applies to men over age 75, men over age 75 are the qualifying group for this measure. In our analyses, inclusion of these indicators helps prevent apparent correlations from arising that are driven by the geographic distribution of patients who qualify for low-value services. For instance, if some regions had a higher incidence of both syncope and osteoarthritis of the knee than average and therefore higher

population rates of imaging for syncope and arthroscopy knee surgery, without adjustment for the prevalence of syncope and osteoarthritis of the knee, the estimated correlation between these two types of services could be positive even if practice patterns in these regions were the same (or even more conservative) relative to other regions. Notably, our results were not sensitive to the inclusion of these indicators.

Supplementary Analysis

In order to assess whether greater total spending predicts greater measured overuse, we examined the association between regional spending on low-value services and total regional spending for Medicare beneficiaries as a supplementary analysis. To do so, we fitted a linear regression model predicting spending on low-value services for each beneficiary as a function of 2009 mean price-adjusted Medicare Part A and B spending per beneficiary at the HRR level and the same set of beneficiaries' sociodemographic and clinical characteristics included in our primary analysis. To facilitate interpretation, we specified total regional spending per beneficiary in quartiles. Following regression analysis, the statistical significance of the association between spending on low-value services and quartile of overall spending was assessed via Wald test of the null hypothesis that adjusted spending on low-value services was equal across quartiles. Regional total Medicare spending was positively associated with measured low-value spending ($P < 0.001$ for test of equality across quartiles). Adjusted per beneficiary spending on services detected by low-value measures ranged from \$282 in the lowest quartile of overall spending to \$326 in the highest quartile of overall spending. This finding is consistent with the interpretation that variation in total spending is predictive of wasteful practices. However, low-value spending varied by less than 20% across quartiles of total regional spending

We conducted a sensitivity analysis assessing the association between spending on low-value services and an alternate measure of total regional Medicare spending. The purpose of this analysis was to test whether the inclusion of low-value spending in measures of overall spending induced the positive association presented above. Unlike the analysis, which used a price-adjusted regional measure of overall Part A and Part B Medicare spending obtained from the Dartmouth Atlas of Health Care, this sensitivity analysis used a measure of overall spending that excluded spending on measured low-value services. The alternate measure was constructed by calculating total Part A and B payments for each beneficiary in our study from the 2009 Beneficiary Annual Summary File (payments by Medicare, beneficiaries, and other payers), multiplying the totals by Dartmouth Atlas regional price adjusters (each calculated as the ratio of price-adjusted regional spending estimates over unadjusted regional spending estimates), subtracting each individual's spending on measured low-value services (based on standardized prices), and computing the average of the resulting value by HRR. The alternate measure of regional total Medicare spending was also positively associated with measured low-value spending ($P < 0.001$ for test of equality across quartiles) and the association was not appreciably attenuated by use of the alternate measure. Adjusted per beneficiary spending on services detected by low-value measures ranged from \$282 in the lowest quartile of overall spending to \$322 in the highest quartile of overall spending.

eTable 1: Codes Used for Measures of Low-Value Care Services

Measure	Codes for detection and restriction criteria	Additional codes for pricing	Group qualifying
Cancer screening for patients with chronic kidney disease (CKD) receiving dialysis	<p>BETOS: P9A P9B (dialysis)</p> <p>CPT/HCPCS: 77057 G0202 (breast screening), G0104-G0106 G0120 -G0122 G0328 82270 (colorectal screening), G0102 G0103 84152-84154 (prostate screening), G0101 G0123 G0124 G0141 G0144 G0145 G0147 G0148 P3000 P3001 Q0091 (cervical screening)</p>	<p>CPT: 36415 (venepuncture), 77051-77059 (mammography add-on codes), 00810 (endoscopy sedation), 87620-87622 (HPV tests)</p>	Patients with CKD ^a
Cervical cancer screening for women over age 65	<p>CPT/HCPCS: G0101 G0123 G0124 G0141 G0144 G0145 G0147 G0148 P3000 P3001 Q0091 (cervical screening)</p> <p>ICD-9:180 184x 2190 2331 2332 2333x 6221 (cervical and other relevant cancers, dysplasias) 7950x-7951x (abnormal Papanicolaou finding, human papillomavirus positivity) V1040 V1041 V1322 (history of cervical cancer, other relevant cancers, dysplasia)</p>	<p>CPT: 87620-87622 (HPV tests)</p>	Women over 65
Colorectal cancer screening for adults older than age 85 years	<p>CCW: Colorectal cancer first indication date</p> <p>CPT/HCPCS: 45330-45345 45378-45392 G0104-G0106 G0120-G0122 G0328 82270 (sigmoidoscopy, colonoscopy, barium enema or blood occult test for colon cancer screening)</p>	<p>CPT: 00810 (sedation)</p>	Patients over 75
Prostate-specific antigen (PSA) testing for men over age 75	<p>CCW: Prostate cancer first indication date</p> <p>CPT/HCPCS: G0103 84152-84154 (PSA testing)</p>	<p>CPT: 36415 (venepuncture)</p>	Men over 75
Bone mineral density testing at frequent intervals	<p>CCW: Osteoporosis first indication date</p> <p>CPT/HCPCS: 76977 77078-77080 77083 78350 78351 (bone density testing)</p>	None	Patients with osteoporosis ^a
Homocysteine testing for cardiovascular disease	<p>CPT/HCPCS: 83090 (homocysteine chemistry) 82746 82747 82607 (folate or B12 testing)</p> <p>ICD-9: 2662 2704 2810-2812 2859 (folate or B12 disorders)</p>	<p>CPT: 36415 (venepuncture)</p>	All patients
Hypercoagulability testing for patients with deep vein thrombosis	<p>CPT/HCPCS: 83090 85300 85303 85306 85613 86147 (hypercoagulability chemistries)</p> <p>ICD-9: 4151 (pulmonary embolism) 4510</p>	<p>CPT: 83890-83914 (nucleic acid molecular diagnostics)</p>	Patients with deep vein thrombosis ^b

	45111 45119 4512 45181 4519 4534 (phlebitis, thrombophlebitis and venous embolism of lower extremity vessels) V1251 (history of venous thrombosis and embolism, pulmonary embolism)		
Parathyroid hormone (PTH) measurement for patients with stage 1-3 CKD	BETOS: P9A P9B (dialysis) CCW: Chronic kidney disease first indication date CPT/HCPCS: 83970 (parathyroid hormone chemistry)	CPT: 36415 (venepuncture)	CKD patients ^a
Preoperative chest radiography	BETOS: P1x P3D P4A P4B P4C P5C P5D P8A P8G (selected surgeries) CPT/HCPCS: 71010 71015 71020-71023 71030 71034 71035 (chest x-ray), 19120 19125 47562 47563 49560 58558 (relevant surgical codes not included in BETOS categories)	None	Patients undergoing selected surgeries ^b
Preoperative echocardiography	BETOS: P1x P3D P4A P4B P4C P5C P5D P8A P8G (selected surgeries) CPT/HCPCS: 93303 93304 93306-93308 93312 93315 93318 (echocardiogram) 19120 19125 47562 47563 49560 58558 (relevant surgical codes not included in BETOS categories)	CPT: 93303-93352 (echocardiography)	Patients undergoing selected surgeries ^b
Preoperative pulmonary function testing (PFT)	BETOS: P1x P2x P3D P4A P4B P4C P5C P5D P8A P8G (selected surgeries) CPT/HCPCS: 94010 (spirometry)	CPT: 94010-94799 (pulmonary non-ventilatory services), 93720-93722 (plethysmography)	Patients undergoing selected surgeries ^b
Preoperative stress testing	BETOS: P1x P3D P4A P4B P4C P5C P5D P8A P8G (selected surgeries) CPT/HCPCS: 78451-78454 78460 78461 78464 78465 78472 78473 78481 78483 78491 78492 93015-93018 93350 93351 (stress testing), 19120 19125 47562 47563 49560 58558 (relevant surgical codes not included in BETOS categories)	CPT: 93000-93042 (ECG), 93303-93352 (all echocardiography), 78414-78499 (all cardiovascular nuclear diagnostic), A9500-A9700 (contrast), J0150 J0152 J0280 J1245 J1250 J2785 (pharmacologic stress test injection)	Patients undergoing selected surgeries ^b
Computed tomography (CT) of the sinuses for uncomplicated acute rhinosinusitis	CPT/HCPCS: 70486-70488 (CT of maxillofacial area) ICD-9: 461x 473x (sinusitis), 2770x 042 07953 279xx (immune disorders), 471x (nasal polyp) 373xx 37600 (eyelid/orbit)	None	Patients with sinusitis diagnosis ^b

	inflammation), 800xx-804xx 850xx-854xx 870xx-873xx 9590x 910xx 920xx-921xx (head or face trauma)		
Head imaging in the evaluation of syncope	<p>CPT/HCPCS: 70450 70460 70470 70551-70553 (CT or MRI of head or brain)</p> <p>ICD-9: 7802 9921 (syncope), 345xx 7803x (epilepsy or convulsions), 43xx (cerebrovascular diseases, including stroke/TIA and subarachnoid hemorrhage), 800xx-804xx 850xx-854xx 870xx-873xx 9590x 910xx 920xx-921xx (head or face trauma), 78097 781xx 7820 7845x (altered mental status, nervous and musculoskeletal system symptoms, including gait abnormality, meningismus, disturbed skin sensation, speech deficits), V1254 V10xx (personal history of stroke/TIA)</p>	None	Patients with syncope diagnosis ^b
Head imaging for uncomplicated headache	<p>CPT/HCPCS: 70450 70460 70470 70551-70553 (CT or MRI of head or brain)</p> <p>ICD-9: 30781 339xx 364x 7840 (headache or migraine), 33920-33922 33943 (post-traumatic or thunderclap headache), 14xx-208xx 230xx-239xx (cancer), 3463x 3466x (migraine with hemiplegia or infarction), 4465 (giant cell arteritis), 345xx 7803x (epilepsy or convulsions), 43xx (cerebrovascular diseases, including stroke/TIA and subarachnoid hemorrhage), 800xx-804xx 850xx-854xx 870xx-873xx 9590x 910xx 920xx-921xx (head or face trauma), 78097 781xx 7845x (altered mental status, nervous and musculoskeletal system symptoms, including gait abnormality, meningismus, disturbed skin sensation, speech deficits), V1254 V10xx (personal history of stroke/TIA or cancer)</p>	None	Patients with headache diagnosis ^b
Electroencephalogram for headaches	<p>CPT/HCPCS: 95812 95813 95816 95819 95822 95827 95830 95957 (electroencephalogram)</p> <p>ICD-9: 30781 339xx 346x 7840 (headaches) 345xx 7803x 7810 (epilepsy or convulsions)</p>	None	Patients with headache diagnosis ^b

<p>Back imaging for patients with non-specific low back pain^c</p>	<p>CPT/HCPCS: 72010 72020 72052 72100 72110 72114 72120 72200 72202 72220 72131-72133 72141 72142 72146-72149 72156 72157 72158 (radiologic, CT, and MRI imaging of spine)</p> <p>ICD-9: 7213 72190 72210 72252 7226 72293 72402 7242-7246 72470 72471 72479 7385 7393 7394 8460-8463 8468 8469 8472 (back pain, various causes), 14xx–208xx 230xx-239xx (cancer), 800x-839xx 850xx-854xx 86xxx 905xx-909xx 92611 92612 929, 952xx 958xx-959xx (trauma), 3040x-3042x 3044x 3054x-3057x (IV drug abuse), 34460 7292x (neurologic impairment), 4210 4211 4219 (endocarditis), 038xx (septicemia), 01xxx (tuberculosis), 730xx (osteomyelitis), 7806x 7830x 7832x 78079 7808x 2859x (fever, weight loss, malaise, night sweats, anemia not due to blood loss)</p>	<p>None</p>	<p>Patients with back pain^b</p>
<p>Screening for carotid artery disease in asymptomatic adults</p>	<p>CPT/HCPCS: 36222-36224 70498 70547-70549 93880 93882 3100F (carotid imaging)</p> <p>CCW: Stroke/TIA first indication date</p> <p>ICD-9: 430 431 43301 43311 43321 43331 43381 43391 43400 43401 43410 43411 43490 43491 4350 4351 4353 4358 4359 436 99702 V1254 (stroke/TIA), 3623 36284 (retinal vascular occlusion/ischemia), 7802 781xx 7820 78451 78452 78459 9921 (nervous and musculoskeletal symptoms)</p>	<p>None</p>	<p>All patients</p>
<p>Screening for carotid artery disease for syncope</p>	<p>CPT/HCPCS: 36222-36224 70498 70547-70549 93880 93882 3100F (carotid imaging)</p> <p>CCW: Stroke/TIA first indication date</p> <p>ICD-9: 7802 9921 (syncope), 430 431 43301 43311 43321 43331 43381 43391 43400 43401 43410 43411 43490 43491 4350 4351 4353 4358 4359 436 99702 V1254 (stroke/TIA), 3623 36284 (retinal vascular occlusion/ischemia), 781xx 7820 78451 78452 78459 (nervous and musculoskeletal symptoms)</p>	<p>None</p>	<p>Patients with syncope diagnosis^b</p>

Stress testing for stable coronary disease	<p>CPT/HCPCS: 93015-93018 93350 93351 78451-78454 78460 78461 78464 78465 78472 78473 78481 78483 78491 78492 (stress testing)</p> <p>CCW: Ischemic heart disease first indication date, AMI first indication date</p>	<p>CPT: 93000-93042 (ECG), 93303-93352 (echocardiography), 78414-78499 (cardiovascular nuclear diagnostic services), A9500-A9700 (contrast), J0150 J0152 J0280 J1245 J1250 J2785 (pharmacologic stress test injection)</p>	IHD patients ^a
Percutaneous coronary intervention with balloon angioplasty or stent placement for stable coronary disease	<p>CPT/HCPCS: 92980 92982 (coronary stent placement or balloon angiography)</p> <p>CCW: Ischemic heart disease first indication date, AMI first indication date</p>	<p>DRG: 246-251^d (percutaneous cardiovascular procedure)</p>	IHD patients ^a
Renal artery angioplasty or stenting	<p>CPT/HCPCS: 35471 35450 37205 37207 75966 75960 (renal artery angioplasty or stenting)</p> <p>ICD-9: 4401 40501 40511 40591 (atherosclerosis of renal artery, renovascular hypertension)</p>	None ^e	Patients with hypertension ^b
Carotid endarterectomy in asymptomatic patients	<p>CPT/HCPCS: 35301 (carotid endarterectomy)</p> <p>CCW: Stroke/TIA first indication date</p> <p>ICD-9: 430 431 43301 43311 43321 43331 43381 43391 43400 43401 43410 43411 43490 43491 4350 4351 4353 4358 4359 436 99702 V1254 (stroke/TIA), 3623 36284 (retinal vascular occlusion/ischemia), 781xx 7820 78451 78452 78459 (nervous and musculoskeletal symptoms)</p>	<p>ICD-9 procedure: 3812 0040-0042[¶] (carotid endarterectomy)</p>	All patients
Inferior vena cava filters for the prevention of pulmonary embolism	<p>CPT/HCPCS: 75940 (radiological supervision of inferior vena cava filter placement)</p>	<p>CPT: 36010 37620 75825 76937 (catheter insertion, IVC interruption, venography, ultrasound guidance)</p>	All patients
Vertebroplasty or kyphoplasty for osteoporotic vertebral fractures	<p>CPT/HCPCS: 22520 22521 22523 22524 (vertebroplasty, kyphoplasty)</p> <p>ICD-9: 73313 8052 8054 (vertebral fracture) , 1702 1985 20300-20302 2132 22809 2380 2386 2392 (primary or secondary neoplasm of vertebral column, multiple myeloma, hemangioma)</p>	None ^e	Patients with osteoporosis ^a

Arthroscopic surgery for knee osteoarthritis	CPT/HCPCS: 29877 29879 G0289 (knee arthroscopy with chondroplasty) ICD-9: 7177 73392 71500 71509 71510 71516 71526 71536 71596 (chondromalacia, osteoarthritis), 8360-8362 7170 71741 (meniscal tear)	None ^e	Patients with arthritis ^a
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- a Defined by presence of CCW first indication date prior to January 1, 2010
- b Defined by presence of relevant diagnosis or procedure codes during 2009.
- c We follow prior literature in defining this measure.²
- d The pricing sample was restricted to detected hospital admissions with these DRG codes. All professional charges for expenses incurred on the same day of service were included in pricing estimates.
- e The pricing sample was restricted to detected episodes that appeared in both the Carrier and Outpatient files. All professional charges for expenses incurred on the same day of service were included in pricing estimates.
- f The pricing sample was restricted to detected hospital admissions with no procedures besides those listed here. All professional charges for expenses incurred on the same day of service were included in pricing estimates.

eTable 2. Use and Associated Spending of Services Detected by Low-Value Service Measures, by Category

<i>Measure Category</i>	More Sensitive Measure						More Specific Measure					
	count (per 100 benefi- ciaries) ^a	% of low- value count	% benefi- ciaries affected	spending (millions)	% of low- value spending	% of overall spending ^b	count (per 100 benefi- ciaries) ^a	% of low- value count	% benefi- ciaries affected	spending (millions)	% of low- value spending	% of overall spending ^b
Cancer Screening	27.0	34%	20%	794	9%	0.26%	10.3	31%	10%	142	7%	0.05%
Diagnostic and preventive testing	11.0	14%	5%	174	2%	0.06%	4.8	14%	3%	77	4%	0.02%
Preoperative testing	7.1	9%	6%	315	4%	0.10%	2.3	7%	2%	125	6%	0.04%
Imaging	25.5	32%	18%	939	11%	0.30%	14.5	43%	12%	620	32%	0.20%
Cardiovascular testing and procedures	9.3	12%	8%	5,886	70%	1.90%	1.2	4%	1%	717	37%	0.23%
Other surgery	0.5	1%	0%	343	4%	0.11%	0.4	1%	0%	259	13%	0.08%
Total	80	100%	42%^c	8,451	100%	2.73%	33	100%	25%^c	1,941	100%	0.63%

a Count refers to the number of unique incidences of service provision.

b Overall spending refers to annual spending for services covered by Part A and B of Medicare. See Table 1 for service category assignments and for operational definitions of all measures.

c Total does not equal column sum because some patients received multiple different services.

eReferences

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