Use and Cost of Low-Value Services Among Veterans Dually Enrolled in VA and Medicare

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ABSTRACT

BACKGROUND: Over half of veterans enrolled in the Veterans Health Administration (VA) are also enrolled in Medicare, potentially increasing their opportunity to receive low-value health services within and outside VA.
OBJECTIVES: To characterize the use and cost of low-value services delivered to dually enrolled veterans from VA and Medicare.
DESIGN: Retrospective cross-sectional.
PARTICIPANTS: Veterans enrolled in VA and fee-for-service Medicare (FY 2017–2018).
MAIN MEASURES: We used VA and Medicare administrative data to identify 29 low-value services across 6 established domains: cancer screening, diagnostic/preventive testing, preoperative testing, imaging, cardiovascular testing, and surgery. We determined the count of low-value services per 100 veterans delivered in VA and Medicare in FY 2018 overall, by domain, and by individual service. We applied standardized estimates to determine each service's cost.
KEY RESULTS: Among 1.6 million dually enrolled veterans, the mean age was 73, 97% were men, and 77% were non-Hispanic White. Overall, 63.2 low-value services per 100 veterans were delivered, affecting 32% of veterans; 22.9 services per 100 veterans were delivered in VA and 40.3 services per 100 veterans were delivered in Medicare. The total cost was $226.3 million (M), of which $62.6 M was spent in VA and $163.7 M in Medicare. The most common low-value service was prostate-specific antigen testing at 17.3 per 100 veterans (VA 55.9%, Medicare 44.1%). The costliest low-value service was percutaneous coronary intervention (VA $10.1 M, Medicare $32.8 M).
CONCLUSIONS: Nearly 1 in 3 dually enrolled veterans received a low-value service in FY18, with twice as many low-value services delivered in Medicare vs VA. Interventions to reduce low-value services for veterans should consider their substantial use of such services in Medicare.

KEY WORDS: low-value care; veterans; quality of care

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INTRODUCTION

More than half of the 9 million veterans enrolled in the Veterans Health Administration (VA) are also enrolled in Medicare, including 91% of veterans aged ≥ 65 years.[1] Such dually enrolled veterans may experience care fragmentation and poor care coordination as they transition between VA and non-VA sources of care, resulting in duplicative health service use, increased costs, and worse health outcomes for a variety of medical conditions.[2–5]

Veterans who are dually enrolled in VA and Medicare may also be at increased risk of receiving low-value care, which is defined as the use of a health service whose harms or costs outweigh its benefits.[6] In fiscal year (FY) 2018, 20 low-value services per 100 VA-enrolled veterans were either directly delivered or paid for by VA, at a cost of $206 million.[7,8] Outside of VA, up to 43% of non-veteran Medicare fee-for-service beneficiaries have received a low-value service.[6] However, the use of low-value services by dually enrolled veterans through VA and Medicare has not been comprehensively characterized. Specifically, the prevalence of overall low-value health service use in VA and Medicare, which system accounts for more low-value service use, and the specific types and costs associated with the delivery of such low-value services remain unknown.

Even if VA successfully limited the delivery of low-value services from VAMCs or VACC programs, veterans who are

dually enrolled in VA and Medicare may continue to receive low-value services through Medicare, resulting in unnecessary harms, increased costs, and cross-system care cascades, in which an initial low-value service in Medicare leads to subsequent care in VA.[9–12] To most effectively decrease veterans' receipt of low-value services and enhance the overall value of care that they receive, it is critical to fully understand their receipt of low-value services in both VA and non-VA healthcare systems. Therefore, among veterans dually enrolled in VA and Medicare, our objective was to characterize their use and the associated costs of a diverse set of low-value services delivered or paid for by VA and Medicare.

METHODS

Study Design, Data Sources, and Cohort

We conducted a retrospective cross-sectional study following the Strengthening the Reporting of Observational Studied in Epidemiology (STROBE) guidelines.[13] The VA Pittsburgh Institutional Review Board exempted this study for review and granted a waiver of informed consent and HIPAA authorization.

We linked national patient-level administrative data from VA and the Centers for Medicare and Medicaid Services. From the VA Corporate Data Warehouse, we compiled VA enrollment data and identified demographic characteristics, medical comorbidities, medical evaluation and management (E&M) encounters, and health services provided at VA Medical Centers (VAMCs) and community-based outpatient clinics.[14]

To identify health services paid for by VA through VA Community Care (VACC) programs, we compiled institutional and professional claims from the VA Program Integrity Tool and Fee-Basis files.[15] We used the VA Planning System and Support Group database to determine census region (i.e., Northeast, Midwest, South, West) and driving time and distance to the nearest VA facility and used the Area Health Resource File to identify the urban influence code that corresponds to each veteran's place of residence.

From the Centers for Medicare and Medicaid Services, we used the Beneficiary Summary file to determine Medicare enrollment and to identify individual sociodemographic characteristics when VA data was missing. We used the Inpatient, Skilled Nursing Facility, Outpatient, Home Health, Hospital, Durable Medical Equipment, and Carrier files to identify diagnosis codes for medical conditions as well as E&M encounters. We used the Carrier and Outpatient files to identify low-value service use, following the approach applied in prior studies evaluating low-value service use in Medicare beneficiaries outside VA.[6]

To construct the study cohort, we identified veterans who were continuously enrolled in VA and fee-for-service Medicare Parts A & B during FYs 2017–2018 and had at least one inpatient or outpatient VA encounter in FY2018 to ensure engagement with VA care (eFigure 1). To broadly identify low-value service use in Medicare, we included dually enrolled veterans, regardless of age.

Identifying Low-Value Services Use

We applied an established metric that contains 29 low-value health services across 6 domains (eTable 1).[6,16] This metric was developed for use in Medicare data and has been previously applied in VA data.[8,17,18]

We applied a set of sensitive (base measure) and specific criteria to define all low-value services. For example, low-back imaging is typically of low value when done within 6 weeks of the onset of non-specific low-back pain, as such pain typically resolves with conservative treatment alone. Therefore, when applying the sensitive criteria, all veterans who underwent such testing would be identified. However, imaging may be appropriate in this period when there are co-occurring "red flag" symptoms, such as lower extremity weakness or incontinence, that may require urgent intervention. When applying the specific criteria, veterans who exhibited these additional symptoms were excluded from the numerator. Our approach to defining low-value services using sensitive and specific criteria accounts for variability in the criteria defining low-value care and the lack of precision in using administrative data to characterize these criteria.[6]

Using these sensitive and specific criteria, we identified low-value services in FY18 in VA and Medicare fee-for-service administrative data and used data from FY15-18 to identify those medical comorbidities, receipt of prior services, and other information required to identify each low-value service.

Calculating the Cost of Low-Value Services

For all services, we applied standardized cost estimates devised by the VA Health Economics Resource Center[19] based upon average national Medicare and private sector reimbursement rates for performing a test or procedure. We used the cost for each unique Common Procedural Terminology code associated with each low-value service, and incorporated costs from facility fees and other necessary ancillary tests, such as venipuncture (eTable 2).[8]

Veteran Sociodemographic and Clinical Characteristics

Using data from FY17, we generated categorical variables for age and self-reported sex and race/ethnicity (i.e., Hispanic, non-Hispanic Black, non-Hispanic White, and other racial or ethnic groups, including individuals self-identifying as American Indian or Alaska Native, Asian, Pacific Islander, or multiracial). We characterized medical comorbidities by applying the Elixhauser Comorbidity Index to

both VA and Medicare medical diagnoses.[20] We also determined each veteran's priority status, which determines the generosity of a veteran's VA health benefits based on the presence and degree of service-connected illnesses, era of service, and income.[21] Using E&M codes from VA and Medicare, we determined the percentage of veterans with any encounter in Medicare and the median and interquartile range of encounters received by veterans in VA (including VACC) and Medicare in FY18.

We also assessed VA facility-level variables that could influence veterans' access to health services, including census region, driving time from their residence to the nearest VA facility, and the rurality of residence using the urban influence code. [7]

Statistical Analysis

We calculated the mean and standard deviation for all continuous sociodemographic variables and frequencies for all categorical variables for the overall cohort and based upon veterans' receipt and source of low-value care: no low-value care, low-value care only from VA, low-value care only from Medicare, low-value care from VA and Medicare.

For the full study cohort, we applied the specific criteria in our primary analyses to determine the total count of low-value services delivered, and the count of low-value services per 100 veterans overall, by domain, and by individual low-value service. We stratified these same measures by services received in VA and/or Medicare. We calculated the percentage of veterans who received a low-value service from VA, Medicare, or both systems. Using the total count of each low-value service as the denominator, we also computed the percentage of each low-value service delivered in VA and Medicare. Using the costs, counts, and healthcare system where services were provided for each low-value service, we estimated the percentage of low-value service costs attributable to each individual service for the full cohort and within VA and Medicare. We conducted the same analyses applying the sensitive criteria.

RESULTS

The study cohort comprised 1,627,779 veterans who were dually enrolled in VA and Medicare and used VA healthcare in FY18 (Table 1).

Among the overall cohort, the mean age was 73.1 (SD 10.4); 11.5% were less than 65 years of age; 96.7% were men; 3.4% Hispanic, 11.2% non-Hispanic Black, and 76.7% were non-Hispanic White. Veterans who received low-value care from any source were older, and greater percentages were non-Hispanic White or lived in the South. Enrollment in priority groups 6–8, which confer less generous VA benefits, was higher for veterans who received low-value care from Medicare (93,702 [35.8%]) or VA and Medicare (18,745 [32.0%]), relative to veterans who received low-value care only from VA (49,214 [24.9%]).

Overall, 1,265,461 (77.7%) had an E&M encounter in Medicare in FY18. Veterans who received low-value care only in VA had more E&M encounters in VA (median 8 [IQR 3–15]) relative to Medicare (2 [0–7]), while veterans who received low-value care only in Medicare had fewer E&M encounters in VA (2 [1–5]) relative to Medicare (16 [9–26]).

Overall Use and Cost of Low-Value Services in VA and Medicare

Applying the specific criteria, 63.2 low-value services per 100 dually enrolled veterans were delivered in FY18; 22.9 services per 100 veterans were delivered in VA, of which 91.5% were delivered directly by VAMCs and 8.5% were delivered through VACC (see eTable 3 for the count and percentage of each low-value service delivered by VAMCs or through VACC). Additionally, 40.3 services per 100 veterans were delivered in Medicare. Overall, 31.8% of dually enrolled veterans received a low-value service—17.5% received one service, 7.5% received two services, and 6.9% received three or more services. Of those veterans who received a low-value service, 15.7% received a service from VA and 19.7% received a low-value service from Medicare. Only 3.6% of veterans received a low-value service from both VA and Medicare. The total cost was $226.3 million, of which $62.6 million was incurred in VA and $163.7 million in Medicare.

By domain (Fig. 1), VA most frequently delivered or paid for cancer screening at 10.1 services per 100 veterans, whereas in Medicare, veterans most frequently received low-value imaging at 13.4 services per 100 veterans. In VA and Medicare, total spending was greatest for cardiovascular testing and procedures, costing $17.9 million in VA and $46.1 million in Medicare.

Use of Individual Low-Value Services

The most frequently delivered individual low-value service from both VA and Medicare was prostate-specific antigen (PSA) testing for men aged ≥ 75 at 17.3 tests per 100 veterans, of which 55.9% were from VA and 44.1% were from Medicare (Table 2). This was followed by preoperative chest radiography at 9.5 tests per 100 veterans, of which 25.5% were from VA and 74.5% were from Medicare.

The low-value services with the greatest proportion delivered or paid for by VA included CT scan of the sinuses for uncomplicated acute rhinosinusitis, where out of 2197 low-value services, 1988 (90.5%) were delivered by VA. This was followed by imaging for plantar fasciitis, where out of 1023 services, 904 (88.4%) were delivered by VA (Table 2).

The low-value services with the greatest proportion from Medicare included electroencephalography for headaches, where out of 3030 total services, 2600 (85.8%) were

Table 1 Characteristics of the Study Cohort Overall and by Receipt and Source of Low-Value Care

Characteristic	Overall cohort	Source of LVC			
		No low-value care	VA only	Medicare only	VA and Medicare
N (row %)	1,627,779 (100%)	1,109,815 (68.2%)	197,603 (12.1%)	261,805 (16.1%)	58,556 (3.6%)
Age, mean (SD), years	73.1 (10.4)	71.7 (10.6)	74.6 (9.0)	77.0 (9.3)	76.8 (8.0)
< 65	187,557 (11.5)	153,725 (13.9)	16,793 (8.5)	14,070 (5.4)	2969 (5.1)
65–74	807,715 (49.6)	621,133 (56.0)	75,984 (38.5)	94,343 (36.0)	16,255 (27.8)
75–84	398,079 (24.5)	194,597 (17.5)	80,887 (40.9)	92,492 (35.3)	30,103 (51.4)
85 +	234,428 (14.4)	140,360 (12.6)	23,939 (12.1)	60,900 (23.3)	9229 (15.8)
Sex					
Male	1,573,222 (96.7)	1,069,166 (96.3)	191,704 (97.0)	255,026 (97.4)	57,326 (97.9)
Female	54,557 (3.3)	40,649 (3.7)	5899 (3.0)	6779 (2.6)	1230 (2.1)
Race and ethnicity					
Hispanic	55,205 (3.4)	39,729 (3.6)	7042 (3.6)	6666 (2.5)	1768 (3.0)
Non-Hispanic Black	182,130 (11.2)	135,090 (12.2)	21,380 (10.8)	20,729 (7.9)	4931 (8.4)
Non-Hispanic White	1,248,429 (76.7)	839,582 (75.7)	154,098 (78.0)	207,983 (79.4)	46,766 (79.9)
Other	40,302 (2.5)	28,458 (2.6)	4896 (2.5)	5635 (2.2)	1313 (2.2)
American Indian or Alaska Native	9858 (0.6)	7019 (0.7)	1202 (0.6)	1272 (0.5)	365 (3.7)
Asian	9811 (0.6)	7000 (0.7)	1015 (0.5)	1552 (0.6)	244 (0.5)
Pacific Islander	10,790 (0.7)	7455 (0.7)	1397 (0.8)	1544 (0.6)	394 (3.7)
Multiracial	9843 (0.6)	6894 (0.7)	1282 (0.7)	1267 (0.5)	310 (0.6)
Missing	101,713 (6.3)	66,956 (6.0)	10,187 (5.2)	20,792 (7.9)	3778 (6.5)
VA priority group*					
1–4	899,596 (55.3)	629,739 (56.7)	104,616 (52.9)	134,534 (51.4)	30,707 (52.4)
5	289,253 (17.8)	202,909 (18.3)	43,755 (22.1)	33,491 (12.8)	9098 (15.5)
6–8	438,647 (27.0)	276,986 (25.0)	49,214 (24.9)	93,702 (35.8)	18,745 (32.0)
Census region					
Northeast	233,732 (14.4)	158,808 (14.3)	22,949 (11.6)	45,133 (17.2)	6842 (11.7)
Midwest	387,281 (23.8)	267,081 (24.1)	49,298 (24.9)	57,919 (22.1)	12,983 (22.2)
South (+ PR/VI)	697,005 (42.8)	461,867 (41.6)	86,522 (43.8)	119,105 (45.5)	29,511 (50.4)
West (+ GU)	307,984 (18.9)	220,790 (19.9)	38,647 (19.6)	39,380 (15.0)	9167 (15.7)
Urban/rural living environment†					
Large Metro	572,557 (35.2)	389,802 (35.1)	64,549 (32.7)	99,906 (38.2)	18,300 (31.3)
Small Metro	618,799 (38.0)	419,223 (37.8)	74,298 (37.6)	101,695 (38.8)	23,583 (40.3)
Micropolitan	240,443 (14.8)	166,507 (15.0)	30,775 (15.6)	34,325 (13.1)	8836 (15.1)
Non-core Rural	195,980 (12.0)	134,283 (12.1)	27,981 (14.2)	25,879 (9.9)	7837 (13.4)
Driving distance to the nearest VA facility, mean (SD)	17.2 (16.8)	17.2 (16.9)	18.0 (18.1)	16.2 (15.4)	17.8 (17.5)
Driving time to the nearest VA facility, mean (SD)	22.7 (17.9)	22.7 (18.0)	23.4 (18.9)	21.7 (16.3)	23.1 (18.5)
Number of Elixhauser conditions, mean (SD)	1.4 (1.8)	1.4 (1.8)	1.9 (2.1)	1.0 (1.5)	1.5 (2.0)
Medicare encounter in FY18	1,265,461(77.7)	806,175 (72.6)	138,925 (70.3)	261,805 (100)	58,556 (100)
Evaluation and management encounters in VA, median (IQR)	4 (2–9)	4 (2–9)	8 (3–15)	2 (1–5)	4 (2–11)
Evaluation and management encounters in Medicare, median (IQR)	4 (0–12)	3(0–9)	2 (0–7)	16 (9–26)	13 (7–22)

Abbreviations: *PR*, Puerto Rico; *GU*, Guam; *VI*, Virgin Islands

*Veterans are assigned to 1 of 8 priority groups (PG) upon VA enrollment based upon service-connected illnesses, era of service, and socioeconomic status determined by means of testing

†Determined using urban influence classification

delivered through Medicare. This was followed by head imaging for syncope, where out of 38,404 services, 32,708 (85.2%) were delivered through Medicare.

Cost of Individual Low-Value Services

The costliest low-value service in both VA and Medicare was a percutaneous coronary intervention for stable coronary disease, costing $46.5 million (20.5% of overall spending). Of this amount, $10.1 million was spent by VA (21.8% of VA expenditures) and $32.8 million was spent by Medicare (20.1% of Medicare expenditures, Table 3). The next most costly service was spinal injection for low-back pain, costing $36.6 million (16.2% of overall spending). Of this amount, $10.1 million was spent by VA (16.1% of VA expenditures) and $26.5 million was spent by Medicare (16.2% of Medicare expenditures).

Application of the Sensitive Low-Value Service Criteria

When applying the sensitive criteria, 146.5 low-value services per 100 dually enrolled veterans were delivered in FY18; 35 services per 100 veterans were delivered in VA and 65 services per 100 veterans were delivered in Medicare. Overall,

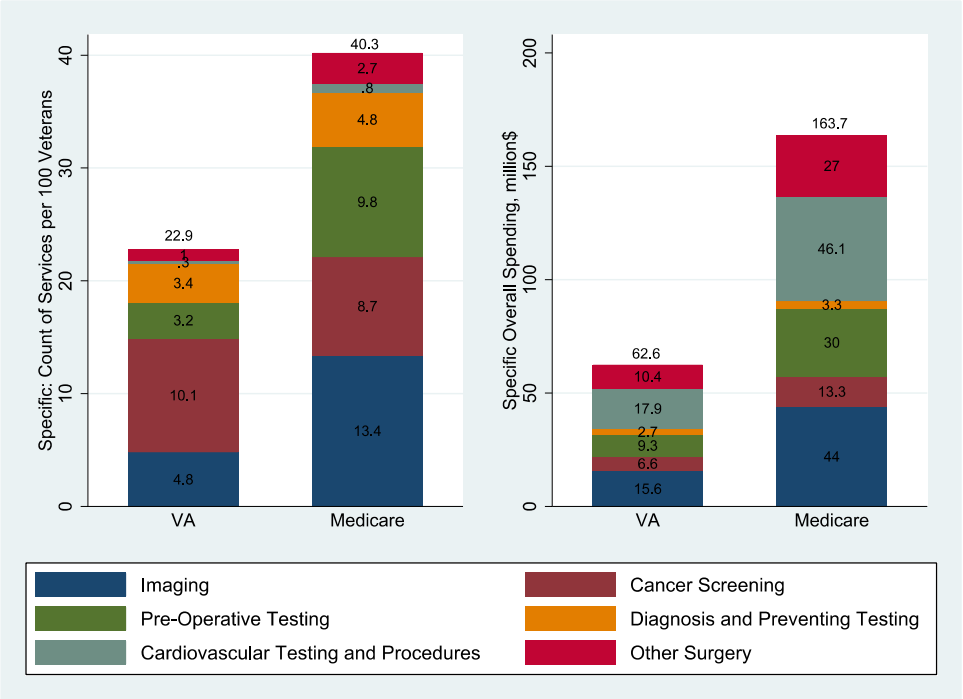

Figure 1 Use and cost of low-value health services by domains delivered to veterans dually enrolled in VA and Medicare in Fiscal Year 2018, stratified by source of care*. Number of services per domain: imaging (8), preoperative testing (4), cardiovascular testing and procedures (5), cancer screening (4), diagnostic and preventive testing (6), other surgery (2). *Depicts services delivered directly by VA or paid for by VA through VA Community Care Programs.

47% of dually enrolled veterans received a low-value service; 25.3% received a service from VA, 30.4% received a low-value service from Medicare, and 8.7% of veterans received a low-value service from both VA and Medicare. The total cost was $884.4 million, of which $229.9 million was incurred in VA and $654.5 million in Medicare.

Patterns of individual low-value service use and cost were like those we observed in our primary analyses applying the specific criteria (eTables 4 and 5).

DISCUSSION

Among a national cohort of veterans dually enrolled in VA and Medicare, when applying the specific low-value care criteria, 63.2 low-value services per 100 veterans were delivered in FY18, affecting 1 in 3 veterans at a cost of $226.3 million. Nearly twice as many low-value services were delivered in Medicare as were delivered in VA. Low-value PSA testing for men aged ≥ 75 was the most common individual service in both VA and Medicare, whereas cardiovascular imaging and procedures were the costliest low-value services from both sources. While the overall count and associated costs of low-value service delivery were greater when applying the sensitive criteria, the relative patterns of individual low-value service use and cost were similar.

These findings build upon prior studies on low-value care in VA[8,17,18] by demonstrating that among veterans dually enrolled in VA and Medicare, nearly twice as many low-value services are delivered in Medicare relative to VA, despite just over half of the overall E&M encounters occurring in Medicare in FY18. Transitioning between VA and non-VA sites of care in the absence of proactive care coordination may result in redundant health service use; however, only 3.6% of veterans in our cohort received a low-value service in both VA and Medicare, suggesting that only a small amount of low-value health services obtained were duplicative.

For dually enrolled veterans, low-value care may be more commonly delivered in non-VA systems for several reasons. First, many non-VA settings have less restrictive policies for ordering tests and procedures and do not possess the same degree of clinical decision support tools embedded in the electronic health record, potentially leading to the increased use of low-value services.[2] Additionally, many of the drivers commonly implicated in the delivery of low-value care, such as operating within a fee-for-service system and fear of litigation, are not present in VA relative to non-VA settings.[22] The amount of low-value service use in Medicare that we observed is consistent with the original findings in Schwartz *et al.*'s seminal paper on low-value service use in Medicare.[6] As our study took place nearly 10 years after Schwartz's original paper, our findings also suggest that low-value service use in Medicare may not have substantially decreased over time, which is consistent with the findings of other studies.[23]

This study has important implications for both veterans, VA, and non-VA health systems. The receipt of low-value

Table 2 Use of Individual Low-Value Services by Domain Overall and in VA and Medicare in Fiscal Year 2018

Individual low-value health services by domain	Overall use		VA[‡]		Medicare	
	Total count[*]	Count per 100 veterans[†]	Count	Row frequency (%)	Count	Row frequency (%)
Cancer screening						
PSA testing for men aged ≥ 75 years	281,499	17.3	157,473	55.9	124,026	44.1
Colorectal cancer screening for adults aged ≥ 75 years	18,311	1.1	3912	21.4	14,399	78.6
Cervical cancer screening for women aged ≥ 65 years	2398	0.1	1431	59.7	967	40.3
Cancer screening for patients with CKD receiving dialysis	4004	0.2	1945	48.6	2059	51.4
Domain total	306,212	18.8	164,761	53.8	141,451	46.2
Imaging						
Back imaging for patients with non-specific low-back pain	64,180	3.9	22,679	35.3	41,501	64.7
Screening for carotid artery disease in asymptomatic adults	113,834	7.0	33,915	29.8	79,919	70.2
Head imaging for uncomplicated headache	58,112	3.6	10,067	17.3	48,045	82.7
Head imaging for syncope	38,404	2.4	5696	14.8	32,708	85.2
CT of the sinuses for uncomplicated acute rhinosinusitis	2197	0.1	1988	90.5	209	9.5
Screening for carotid artery disease for syncope	15,854	1.0	2609	16.5	13,245	83.5
Imaging for diagnosis of plantar fasciitis	1023	0.1	904	88.4	119	11.6
EEG for headaches	3030	0.2	430	14.2	2600	85.8
Domain total	296,634	18.2	78,288	26.4	218,346	73.6
Preoperative testing						
Preoperative chest radiography	155,386	9.5	39,585	25.5	115,801	74.5
Preoperative echocardiography	28,320	1.7	5602	19.8	22,718	80.2
Preoperative stress testing	21,892	1.3	4920	22.5	16,972	77.5
Preoperative PFT	7303	0.4	2626	36.0	4677	64.0
Domain total	212,901	13.1	52,733	24.8	160,168	75.2
Diagnostic and preventive testing						
PTH measurement for patients with stage 1–3 CKD	77,739	4.8	33,950	43.7	43,789	56.3
1,25-dihydroxyvitamin D testing in the absence of hypercalcemia or decreased kidney function	10,497	0.6	8338	79.4	2,159	20.6
Total or free T3 level testing for patients with hypothyroidism	36,362	2.2	8731	24.0	27,631	76.0
Homocysteine testing for CVD disease	5204	0.3	1514	29.1	3690	70.9
BMD testing at frequent intervals	2835	0.2	1823	64.3	1012	35.7
Hypercoagulability testing for patients with deep vein thrombosis	984	0.1	595	60.5	389	39.5
Domain total	133,621	8.2	54,951	41.1	78,670	58.9
Other procedures						
Spinal injection for low-back pain	60,734	3.7	16,682	27.5	44,052	72.5
Arthroscopic surgery for knee osteoarthritis	292	0.02	104	35.6	188	64.4
Domain total	61,026	3.7	16,786	27.5	44,240	72.5
Cardiovascular testing and procedures						
Stress testing for stable coronary disease	11,374	0.7	2802	24.6	8572	75.4
PCI with balloon angioplasty or stent placement for stable coronary disease	4372	0.3	1285	29.4	3087	70.6
IVC filters to prevent pulmonary embolism	1791	0.1	424	23.7	1367	76.3
Renal artery angioplasty or stenting[§]	359	0.02	-	-	-	-
Carotid endarterectomy in asymptomatic patients[§]	20	0.001	-	-	-	-
Domain total	17,916	1.1	4594	25.6	13,322	74.4
Grand total	1,028,310	63.2	372,113	36.2	656,197	63.8
Count of evaluation and management visits	26,897,877	1650	12,153,430	45.2	14,744,447	54.8

Abbreviations: *VACC*, VA Community Care; *PSA*, prostate-specific antigen; *EEG*, electroencephalogram; *PTH*, parathyroid hormone; *CVD*, cardiovascular disease; *CT*, computerized tomography; *CKD*, chronic kidney disease; *PFT*, pulmonary function testing; *BMD*, bone mineral density; *PCI*, percutaneous coronary intervention; *IVC*, inferior vena cava

[*]Counts represent low-value health services identified applying the specific criteria

[†]Denominator is 1,627,779 for the full cohort

[‡]Includes low-value services from VA facilities and VA Community Care programs

[§]Data are censored to avoid presenting small cell sizes in accordance with our Data Use Agreement with the Centers for Medicare and Medicaid Service

Table 3 Cost of Individual Low-Value Services by Domain Overall and in VA and Medicare in Fiscal Year 2018

Individual low-value health services by domain	Overall cost		VA*		Medicare	
	Total cost ($)	Proportion of overall cost	Total cost ($)	Proportion of overall cost	Total cost ($)	Proportion of overall cost
Cancer screening						
PSA testing for men aged ≥ 75 years	7,133,060	3.2	4,010,399	6.4	3,122,662	1.9
Colorectal cancer screening for adults aged ≥ 75 years	11,628,115	5.1	2,182,422	3.5	9,445,692	5.8
Cervical cancer screening for women aged ≥ 65 years	125,190	0.1	80,403	0.1	44,787	0.0
Cancer screening for patients with CKD receiving dialysis	1,060,754	0.5	357,021	0.6	703,733	0.4
Domain total	19,947,120	8.8	6,630,245	10.6	13,316,874	8.1
Imaging						
Back imaging for patients with non-specific low-back pain	12,581,692	5.6	4,151,572	6.6	8,430,119	5.1
Screening for carotid artery disease in asymptomatic adults	22,641,261	10.0	6,905,841	11.0	15,735,421	9.6
Head imaging for uncomplicated headache	12,685,053	5.6	2,345,778	3.7	10,339,276	6.3
Head imaging for syncope	7,532,194	3.3	1,115,837	1.8	6,416,357	3.9
CT of the sinuses for uncomplicated acute rhinosinusitis	371,174	0.2	335,096	0.5	36,078	0.0
Screening for carotid artery disease for syncope	2,693,528	1.2	504,636	0.8	2,188,892	1.3
Imaging for diagnosis of plantar fasciitis	79,123	0.0	68,560	0.1	10,563	0.0
EEG for headaches	939,184	0.4	133,639	0.2	805,545	0.5
Domain total	59,523,209	26.3	15,560,959	24.9	43,962,250	26.9
Preoperative testing						
Preoperative chest radiography	11,276,364	5.0	2,903,849	4.6	8,372,515	5.1
Preoperative echocardiography	15,310,275	6.8	3,073,449	4.9	12,236,825	7.5
Preoperative stress testing	11,668,606	5.2	2,959,153	4.7	8,709,453	5.3
Preoperative PFT	1,058,569	0.5	380,638	0.6	677,931	0.4
Domain total	39,313,814	17.4	9,317,090	14.9	29,996,724	18.3
Diagnostic and preventing testing						
PTH measurement for patients with stage 1–3 CKD	4,197,862	1.9	1,833,281	2.9	2,364,581	1.4

Table 3 (continued)

Individual low-value health services by domain	Overall cost		VA*		Medicare	
	Total cost ($)	Proportion of overall cost	Total cost ($)	Proportion of overall cost	Total cost ($)	Proportion of overall cost
1,25-dihydroxyvitamin D testing in the absence of hypercalcemia or decreased kidney function	529,043	0.2	420,231	0.7	108,812	0.1
Total or free T3 level testing for patients with hypothyroidism	823,231	0.4	198,614	0.3	624,617	0.4
Homocysteine testing for CVD disease	123,646	0.1	35,972	0.1	87,674	0.1
BMD testing at frequent intervals	340,839	0.2	213,227	0.3	127,612	0.1
Hypercoagulability testing for patients with deep vein thrombosis	30,688	0.0	18,228	0.0	12,461	0.0
Domain total	6,045,309	2.7	2,719,552	4.3	3,325,756	2.0
Other procedures						
Spinal injection for low-back pain	36,578,290	16.2	10,093,308	16.1	26,484,982	16.2
Arthroscopic surgery for knee osteoarthritis	838,596	0.4	303,912	0.5	534,684	0.3
Domain total	37,416,886	16.5	10,397,221	16.6	27,019,665	16.5
Cardiovascular testing and procedures						
Stress testing for stable coronary disease	5,859,806	2.6	1,652,404	2.6	4,207,402	2.6
PCI with balloon angioplasty or stent placement for stable coronary disease	46,478,940	20.5	13,638,525	21.8	32,840,415	20.1
IVC filters to prevent pulmonary embolism	8,054,129	3.6	1,907,893	3.0	6,146,236	3.8
Renal artery angioplasty or stenting†	-	-	-	-	-	-
Carotid endarterectomy in asymptomatic patients†	-	-	-	-	-	-
Domain total	64,029,833	28.3	17,944,915	28.7	46,084,919	28.2
Grand total	226,276,171	100.0	62,569,981	100.0	163,706,189	100.0

Abbreviations: *VACC*, VA Community Care; *PSA*, prostate-specific antigen; *EEG*, electroencephalogram; *PTH*, parathyroid hormone; *CVD*, cardiovascular disease; *CT*, computerized tomography; *CKD*, chronic kidney disease; *PFT*, pulmonary function testing; *BMD*, bone mineral density; *PCI*, percutaneous coronary intervention; *IVC*, inferior vena cava

*Includes low-value services from VA facilities and VA Community Care programs

†Data are censored to avoid presenting small cell sizes in accordance with our Data Use Agreement with the Centers for Medicare and Medicaid Service

services results in physical, psychological, and financial harms and erodes trust in the healthcare system.[9] When deciding whether to pursue care in VA vs Medicare, our findings may empower veterans to make more informed healthcare choices based upon their risk of receiving additional potentially unnecessary care. Our results also demonstrate clear opportunities for cost savings within Medicare, which still largely operates within a fee-for-service model. Within VA, reducing low-value care would enable VAMCs to direct their resources to those services of greatest value to veterans, enhancing efficiency.

Additionally, we have demonstrated that it is of critical importance to understand the extent to which veterans receive care both within and outside VA to most effectively enable health systems to enhance the overall value of healthcare that veterans receive. Even if VA were to eliminate every low-value service that it directly delivered or paid for, veterans dually enrolled in VA and Medicare would continue to receive low-value care outside VA, which would continue to affect VA as veterans seek subsequent care in the form of low-value care cascades within VA.[24] Taken together, these findings illustrate the need for more robust care coordination across healthcare systems as a component of any intervention that seeks to reduce the use of low-value services among veterans seeking care in both VA and non-VA healthcare systems.

Limitations

Our study has important limitations. First, not all considerations that inform the value of a service may be captured in administrative data. For example, the administrative codes used to identify low-value spinal injections may over-capture other similar procedures that are considered to be appropriate.[25] However, applying both sensitive and specific criteria for each low-value service allows us to establish a range of potential uses for each low-value service. Second, while prior studies have validated the use of claims-based measures of low-value care via chart review in non-VA healthcare systems, the accuracy of these measures has not been specifically validated for use in VA. Third, we only included Medicare data for fee-for-service beneficiaries, which may limit the generalizability of our findings. Fourth, factors such as the pandemic and the implementation of new VA policies, such as the MISSION Act, may have impacted the sources from which veterans receive low-value care since these data were collected. Thus, our findings represent a starting from which future research may investigate trends in the delivery of low-value care from VA and non-VA sources. Lastly, while we described that veterans in our cohort received more low-value care from Medicare relative to VA, further research is needed to characterize how the nature and ratio of VA and non-VA care that a veteran receives is associated with low-value service use and whether exposure to non-VA care through Medicare has a causal impact on their likelihood of receiving low-value services.

CONCLUSION

Among veterans dually enrolled in VA and Medicare, low-value care is common, affecting between one-third to half of veterans. Except for cancer screening, most low-value services were more frequently delivered in Medicare. These data demonstrate the importance of non-VA care as a source of low-value services delivered to veterans when considering interventions to most effectively improve the overall value of care that they receive.

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Declarations:

Conflict of Interest: *Aaron Schwartz reports receiving personal fees from the Lown Institute, CVS Health, and the Medicare Payment Advisory Commission for prior research consulting outside the scope of the submitted work.*

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