




CLINICAL INVESTIGATION

Care cascades following low-value cervical cancer screening in dually enrolled Veterans

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Abstract

Background: Veterans dually enrolled in the Veterans Health Administration (VA) and Medicare commonly experience downstream services as part of a care cascade after an initial low-value service. Our objective was to characterize the frequency and cost of low-value cervical cancer screening and subsequent care cascades among Veterans dually enrolled in VA and Medicare.

Methods: This retrospective cohort study used VA and Medicare administrative data from fiscal years 2015 to 2019. The study cohort was comprised of female Veterans aged >65 years and at low risk of cervical cancer who were dually enrolled in VA and Medicare. Within this cohort, we compared differences in the rates and costs of cascade services related to low-value cervical cancer screening for Veterans who received and did not receive screening in FY2018, adjusting for baseline patient- and facility-level covariates using inverse probability of treatment weighting.

Results: Among 20,972 cohort-eligible Veterans, 494 (2.4%) underwent low-value cervical cancer screening with 301 (60.9%) initial screens occurring in VA and 193 (39%) occurring in Medicare. Veterans who were screened experienced an additional 26.7 (95% CI, 16.4–37.0) cascade services per 100 Veterans compared to those who were not screened, contributing to \$2919.4 (95% CI, –265 to 6104.7)

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per 100 Veterans in excess costs. Care cascades consisted predominantly of subsequent cervical cancer screening procedures and related outpatient visits with low rates of invasive procedures and occurred in both VA and Medicare.

Conclusions: Veterans dually enrolled in VA and Medicare commonly receive related downstream tests and visits as part of care cascades following low-value cervical cancer screening. Our findings demonstrate that to fully capture the extent to which individuals are subject to low-value care, it is important to examine downstream care stemming from initial low-value services across all systems from which individuals receive care.

KEYWORDS

cervical cancer screening, low-value care, Veterans Health Administration

INTRODUCTION

Low-value care, defined as the use of a health service whose costs or harms exceed its benefits, can result in unnecessary healthcare expenditures as well as physical and psychological harms to patients.^{1,2} Low-value cancer screening is common within the Veterans Health Administration (VA), affecting between 26% and 39% of Veterans in FY2018.³ This includes low-value cervical cancer screening, which affects 6% of older female Veterans, defined as cervical cancer screening in women over the age of 65 years who have had adequate prior screening and are at low risk of cervical cancer.^{3–5}

Like other low-value services, low-value cervical cancer screening may lead to care cascades, which have not been previously characterized in older US Veterans. Care cascades are defined as additional testing, treatments, procedures, or visits that occur as a result of the low-value service, such as those related to receiving follow-up cervical procedures like a colposcopy.^{1,6–9} Furthermore, nearly all older VA-enrolled Veterans at risk of undergoing low-value cervical cancer screening are also enrolled in Medicare and may receive care in non-VA healthcare settings.^{10–12} Such dual enrollment has been shown to increase their risk of experiencing healthcare overuse including low-value care cascades.^{9,13,14} Whereas rates of low-value cervical cancer screening have been estimated within VA alone,^{3,4} low-value cervical cancer screening and subsequent care cascades that Veterans experience both within and outside VA through Medicare have not been characterized. This information is essential when prioritizing and developing interventions and policies aimed at reducing low-value care and value-based performance measures among VA-enrolled Veterans.

Thus, the overall objective of this study was to characterize the frequency and cost of low-value cervical cancer

Key points

- Veterans who underwent low-value cervical cancer screening experienced approximately 27 additional related downstream services per 100 Veterans as part of a care cascade compared to those who were not screened.
- This resulted in \$2919 in excess costs per 100 Veterans due to care cascades.
- Among those who underwent low-value cervical cancer screening, 61% of initial screenings occurred in Veterans Health Administration and 39% occurred in Medicare and cascade services occurred in both healthcare systems.

Why does this paper matter?

Care cascades following low-value cervical cancer screening are common among Veterans dually enrolled in Veterans Health Administration and Medicare and occur in multiple healthcare systems.

screening and subsequent care cascades among Veterans dually enrolled in VA and Medicare.

METHODS

Study overview and data sources

We conducted a retrospective cohort study of Veterans continuously enrolled in VA and fee-for-service Medicare using linked national patient data from October 1, 2014–September 30, 2019 (FY2015–2019) from the

VA and US Centers for Medicare and Medicaid Services (CMS). This study was deemed exempt by the VA Pittsburgh Healthcare System Institutional Review Board, which also granted a waiver of informed consent and HIPAA authorization. The study followed the Strengthening Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Data sources included the VA Corporate Data Warehouse for patient sociodemographic characteristics, comorbidities, and healthcare use within VA facilities; the Area Health Resource File and VA Support Service Center files for facility-level covariates; and the VA Planning Systems Support Group database for driving distance to the nearest VA facility from patient zip code. CMS data sources included the Beneficiary Summary File for patient enrollment and sociodemographic data, and the MEDPAR (Medicare Provider Analysis and Review), Inpatient, Skilled Nursing Facility, Outpatient, Home Health Agency, Hospice, Durable Medical Equipment, and Carrier files for healthcare use paid for by Medicare.

Study cohort, exposure group, and control group

From an existing national cohort of VA beneficiaries aged ≥ 65 continuously enrolled in VA and fee-for-service Medicare ($n = 1,415,334$),^{3,9} we identified a cohort of Veterans for whom cervical cancer screening would be considered low-value based on accepted guidelines, prior studies examining low-value cervical cancer screening, and the clinical expertise of the research team.^{4,8,15–17} First, we identified female Veterans aged >65 with at least one outpatient primary care or gynecology visit in VA or Medicare during FY2017 and FY2018. This initial face-to-face visit in FY2017 would provide Veterans the opportunity to undergo appropriate screening after a long gap in care and thus make it more likely that cervical cancer screening conducted in FY2018 is low value.

We then used Common Procedural Terminology (CPT) codes within both VA and Medicare to identify Veterans in this group who underwent cervical cancer screening within 7 days of an outpatient primary care or gynecology visit in FY2018.⁸ For Veterans who underwent cervical cancer screening more than once that year, we considered the first test as the index service. To construct the final study cohort, we then excluded those with history of relevant genital cancers, benign neoplasms, and dysplasias; an abnormal Papanicolaou (Pap) smear; human immunodeficiency virus (HIV); hazardous exposures such as diethylstilbestrol (DES) exposure; and/or hysterectomy within 3 years prior to the index date using VA and Medicare claims as these Veterans may have

higher than average risk of cervical cancer or have other indications for testing outside of standard guidelines.^{4,8,15,17} The index date corresponds to the date of the low-value cervical cancer screening or the first primary care or gynecology visit for those who did not undergo cervical cancer screening. After applying exclusion criteria, the exposure group consisted of those Veterans who underwent cervical cancer screening, and the comparison group consisted of the remaining Veterans in the study cohort (i.e., those who had a primary care or gynecology visit but no cervical cancer screening in FY2018). The algorithms and administrative billing codes used to generate the study cohort are detailed in Supplementary Table 1.

Outcomes

Within 1 year following the initial test (for the exposure group) or outpatient visit (for the comparison group), we identified the following cascade services using both VA or Medicare claims: (1) subsequent cervical cancer screening, (2) outpatient gynecology visit for abnormal cervical cancer screening, (3) outpatient non-gynecology visit for abnormal cervical cancer screening, (4) cervical procedures including colposcopy, diagnostic excisional procedures, and ablative procedures, (5) hysterectomy (Supplementary Table 1). These outcomes were selected based on relevant studies in peer-reviewed literature and the expertise of practicing clinicians on the research team.^{8,16,18} We chose an outcome period of 1 year in order to capture follow-up tests and procedures that may be scheduled several months from the initial test without over-capturing tests and procedures that may not be related to the initial test.

We utilized VA Health Economics Resource Center (HERC) value estimates to determine cost of the initial cervical cancer screening and cascade services. These validated estimates represent hypothetical reimbursement based on national Medicare and private-sector reimbursement rates and incorporate applicable facility fees.¹⁹ These costs do not include other fees such as patient payments or the cost of associated services like venipuncture.

Patient- and facility-level covariates

Using VA and Medicare data from FY2017, we established the following patient-level covariates: categorical age, race/ethnicity (Hispanic, non-Hispanic Black, non-Hispanic White, other racial or ethnic minority group, or multiracial captured by self-report at time of enrollment),

VA priority group (assigned at VA enrollment based on service-connected illness, era of service, and socioeconomic status), driving distance to nearest VA facility, total number and presence of individual Elixhauser conditions.²⁰ We also determined the parent-station VA medical center where each Veteran received the majority of their outpatient care in FY2017 and established the following facility-level covariates: census region, rurality, and facility-level complexity (based on patient volume, number and breadth of physician specialists, patient case mix, intensive care capabilities, and degree of teaching and research).²¹ We imputed missing values for covariates ($\leq 5\%$ on any individual covariate) using single imputation by chained equations.

Statistical analysis

Within the exposure and comparison groups, we determined the unadjusted rate of total cascade services and each individual service per 100 Veterans, as well as the unadjusted difference in rates of cascade services between the exposure and comparison groups during the one-year outcome period. By accounting for the baseline rate of cascade services within the comparison group, the difference in rates between the exposure and comparison groups represents the rate of cascade services that could plausibly be attributed to the initial low-value cervical cancer screening. We then adjusted for patient- and facility-level covariates using inverse probability weighting (IPW).²² We also applied robust variance estimates to our model, adjusting for clustering effects at the VA facility level. Among only those Veterans who underwent low-value cervical cancer screening, we constructed additional IPW models to compare the total rate of cascade services between Veterans who underwent initial screening in VA versus Medicare. We also determined the unadjusted counts of total cascade services delivered by VA versus Medicare.

Within the exposure and comparison groups, we also determined the unadjusted overall and individual cost of cascade services per 100 Veterans as well as the unadjusted difference in cost per 100 Veterans between the exposure and comparison groups. We then used IPW to determine the adjusted difference in cost per 100 Veterans between both groups. To account for the highly skewed nature of the cost data, which contains many zero values, we estimated standard errors and 95% confidence intervals using a nonparametric bootstrap approach, a more flexible approach for comparing arithmetic means despite non-normality of distributions.²³ All analyses were conducted using SAS, version 7.1 (SAS Institute) and Stata, version 15.1 (StataCorp).

RESULTS

From an overall cohort of 1,415,334 patients aged ≥ 65 dually enrolled in VA and Medicare, we identified 23,311 female Veterans aged >65 with at least one outpatient primary care or gynecology visit in FY2017 and FY2018 (Figure 1). After excluding 2339 patients based on our eligibility criteria, 20,972 Veterans were included in the final study cohort of which 494 (2.4%) underwent low-value cervical cancer screening in FY2018 (Table 1). For 301 (1.4%) Veterans, initial screening occurred within VA and for 193 (0.9%) Veterans, initial screening occurred through Medicare. The standardized mean differences (SMD) were less than 0.1 for all weighted patient and facility-level covariates, indicating appropriate balance for all covariates through use of our propensity score models. (Supplementary Table 2).

After adjusting for patient- and facility-level covariates, the exposure group underwent 26.7 (95% CI, 16.4–37.0) additional cascade services per 100 Veterans compared to the comparison group. The adjusted difference in rate of

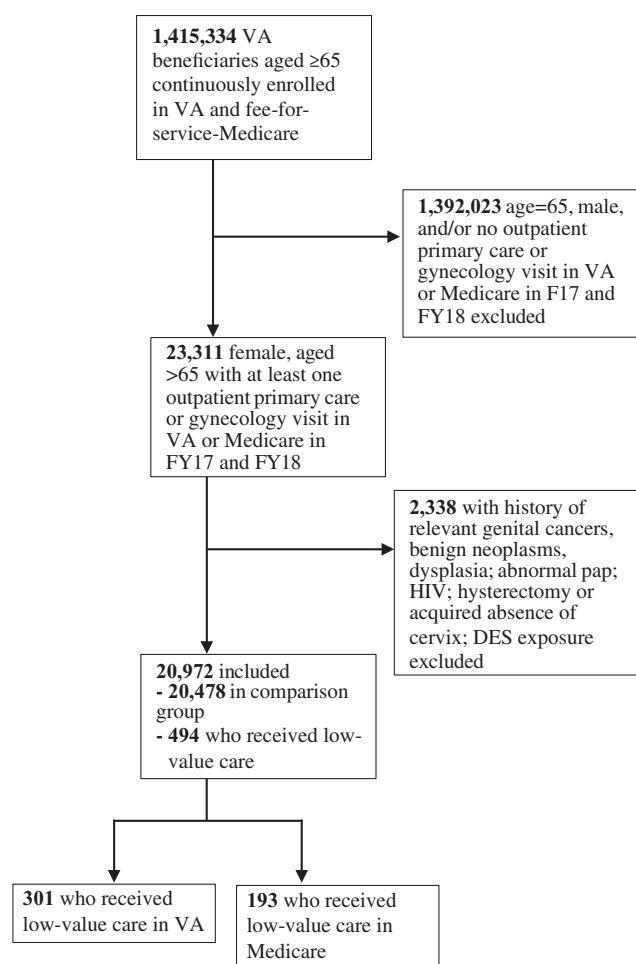


FIGURE 1 Veterans Health Administration and Medicare fee-for-service dual enrollees ($N = 20,972$) at risk of receiving low-value cervical cancer screening in fiscal year (FY) 2018.

TABLE 1 Baseline patient- and facility-level characteristics of Veterans in study cohort, exposure, and control groups.^a

Characteristics	Study cohort (n = 20,972)	Exposure group (n = 494)	Comparison group (n = 20,478)
Patient-level			
Age, years, mean (SD) ^b	74.7 (8.4)	70.1 (5.0)	74.8 (8.4)
Race and ethnicity, no. (%)			
Hispanic	594 (2.8)	30 (6.1)	564 (2.8)
Non-Hispanic Black	2786 (13.3)	90 (18.2)	2696 (13.2)
Non-Hispanic White	16,948 (80.8)	362 (73.3)	16,586 (81.0)
Other non-Hispanic racial or ethnic minority group or multiracial ^c	644 (3.1)	12 (2.4)	632 (3.1)
VA priority group, no. (%) ^d			
1–4	9323	261	9062
5	5704	98	5606
6–8	5945	134	5810
Driving distance to the nearest VA facility, miles, mean (SD)	15.2 (15.6)	14.5 (14.4)	15.2 (15.7)
No. of Elixhauser conditions, mean (SD)	2.5 (2.2)	2.2 (2.1)	2.5 (2.2)
Facility-level			
Census region, no. (%)			
Northeast	2625 (12.5)	73 (14.8)	2552 (12.5)
Midwest	4060 (19.4)	84 (17.0)	3976 (19.4)
South	9181 (43.8)	229 (46.4)	8952 (43.7)
West	5106 (24.4)	108 (21.9)	4998 (24.4)
Rurality, no. (%)			
Large metropolitan	7662 (36.5)	199 (40.3)	7463 (36.4)
Small metropolitan	8501 (40.5)	185 (37.5)	8316 (40.6)
Micropolitan	2897 (13.8)	64 (13.0)	2833 (13.8)
Noncore rural	1912 (9.1)	46 (9.3)	1866 (9.1)
Facility complexity level, no. (%) ^e			
High	16,276 (77.6)	418 (84.6)	15,858 (77.4)
Medium	2209 (10.5)	38 (7.7)	2171 (10.6)
Low	2487 (11.9)	38 (7.7)	2449 (12.0)

^aValues are presented before applying inverse probability weighting. Missing values for race/ethnicity, VA priority group, driving distance, census region, and rurality generated using single imputation.

^bMean age is presented here; categorical age (65–74, 75–85, ≥75) were included in our models to optimize balance among all covariates.

^cOther non-Hispanic racial or ethnic minority group includes American Indian or Alaska Native, Asian, and native Hawaiian or other Pacific Islander.

^dDetermined at the time of VHA enrollment and based on service-connected illnesses, era of service, and socioeconomic status. Priority groups are condensed here based on similarity of copays between groups but included separately in our models.

^eBased on VA Medical Center's patient volume, number and breadth of physician specialties, patient case mix, intensive care unit capabilities, and degree of teaching and research.

additional cascade services per 100 Veterans was the highest for subsequent cervical cancer screening (11.5 [95% CI, 6.5–16.5]), outpatient non-gynecologic visit for an abnormal cervical cancer screening (5.9 [95% CI, 1.2–10.7]), and outpatient gynecologic visit for an abnormal cervical cancer screening (4.4 [95% CI, 1.3–7.4]). Other cascade services occurred at relatively low rates (Table 2). With

regard to the source of cascade services, among those who underwent low-value cervical cancer screening in either system, we found that the unadjusted rate of total cascade services was 21.1 per 100 Veterans delivered by VA and 9.7 per 100 Veterans delivered by Medicare.

Among the 494 Veterans who underwent low-value cervical cancer screening, we found that those who

underwent initial screening within VA experienced 20.7 (95% CI, 3.7–37.7) additional cascade services per 100 Veterans compared to those who underwent initial screening through Medicare.

Among the 494 Veterans who underwent low-value cervical cancer screening, the total cost of the initial cervical cancer screening and subsequent cascade services was \$22,083 (\$10,923 for the initial screen and \$11,156 for the cascade services). Compared to the comparison group, the exposure group incurred an additional \$2919.4

(95% CI, –265–6104.7) per 100 Veterans due to cascade services with hysterectomy being the costliest downstream procedure (Table 3).

DISCUSSION

Among a national cohort of older female Veterans dually enrolled in VA and Medicare, we found that low-value cervical cancer screening resulted in 26.7 additional

TABLE 2 Difference in use of cascade services among Veterans in exposure and comparison groups.

Cascade service	Rate per 100 Veterans		Unadjusted difference in rate	Adjusted difference in rate (95% CI) ^a
	Unadjusted rate			
	Exposure group (n = 494)	Comparison group (n = 20,478)		
Total	30.8	4.1	26.7	26.7 (16.4–37.0)
Subsequent cervical cancer screening	18.4	3.7	14.8	11.5 (6.5–16.5)
Non-gynecologic outpatient visit for abnormal screening ^b	5.3	0.1	5.2	5.9 (1.2–10.7)
Gynecology visit for abnormal screening ^b	3.6	0.1	3.6	4.4 (1.3–7.4)
Cervical procedures ^c	3.4	0.2	3.2	4.9 (1.0–8.9)

^aAdjusted for patient- and facility-level covariates (categorical age, race/ethnicity, VA priority group, driving distance to nearest VA facility, number of Elixhauser conditions, individual Elixhauser conditions, census region, rurality, complexity level) using inverse probability weighting.

^bIncludes associated diagnosis codes for abnormal cervical cancer screening (cytology or high-risk HPV type).

^cIncludes colposcopy, diagnostic excisional procedures, ablative procedures, hysterectomy.

TABLE 3 Difference in cost of cascade services among Veterans in exposure and comparison groups.

Cascade service	Cost per 100 Veterans, \$		Unadjusted difference in cost	Adjusted difference in cost (95% CI) ^a
	Unadjusted cost			
	Exposure group (n = 494)	Comparison group (n = 20,478)		
Total	2258.3	164.6	2093.8	2919.4 (–265–6104.7)
Subsequent cervical cancer screening	415.0	73.7	341.3	264.6 (108.1–421.1)
Non-gynecologic outpatient visit for abnormal screening ^b	384.8	8.2	376.6	504.6 (60.6–948.7)
Gynecology visit for abnormal screening ^b	258.7	5.3	253.4	374.3 (106.3–642.3)
Cervical procedures ^c	1199.8	77.3	1122.5	1775.8 (–1211.3–4762.9)

^aAdjusted for patient- and facility-level covariates (categorical age, race/ethnicity, VA priority group, driving distance to nearest VA facility, number of Elixhauser conditions, individual Elixhauser conditions, census region, rurality, complexity level) using inverse probability weighting.

^bIncludes associated diagnosis codes for abnormal cervical cancer screening (cytology or high-risk HPV type).

^cIncludes colposcopy, diagnostic excisional procedures, ablative procedures, hysterectomy.

cascade services per 100 Veterans as compared to those who did not undergo low-value cervical cancer screening. Among Veterans who underwent low-value cervical cancer screening, those who underwent initial screening within VA experienced significantly more cascade services compared to those who underwent initial screening within Medicare. Additionally, nearly half of the total cost of screening was accounted for by cascade services, rather than the initial screening costs alone.

This work is consistent with prior studies examining subsequent care following low-cervical cancer screening outside VA. For example, among a sample of low-risk patients undergoing annual health examinations, Bouck et al. demonstrated that low-value Papanicolaou testing to screen for cervical cancer was associated with approximately 1.3 additional outpatient gynecology visits, 53 additional Pap tests, and 0.8 additional colposcopies per 100 patients within 180 days from the initial test.⁸ The differences in rates of individual services compared to our study can likely be explained by varying practice patterns within VA, different outcome periods, and the fact that Bouck et al. also included women aged 13–20 who may be more likely to receive a repeat Pap test within this short outcome period. Our findings build upon this prior work as we are the first to examine care cascades after cervical cancer screening in older US Veterans, who may receive care from multiple sources.

Our findings are also consistent with prior studies in demonstrating that low-value cervical cancer screening occurs at low-rates within VA.^{3,4} However, in examining downstream care potentially resulting from the initial low-value test as well as care outside of VA, we better characterize the full extent of care that Veterans receive as a result of low-value cervical cancer screening, which is essential when prioritizing low-value services to target for de-implementation. We did not account for unmeasured costs such as patient anxiety surrounding false positives, inconveniences with attending follow-up visits, and risks of more invasive procedures, which should also be taken into consideration when considering the full burden of care that Veterans experience.

We also found that those who underwent initial screening within VA experienced more downstream care compared to those who underwent initial screening in Medicare. This is likely explained by the fact that VA is an integrated healthcare system and thus Veterans were more likely to undergo follow-up visits and procedures. Additionally, we found that most care cascade services occurred in the same healthcare system as the initial test. This differs from prior studies examining care cascades in dually enrolled Veterans where cascade services occurred in different healthcare systems.⁸ This may suggest that Veterans have better access to care related to an abnormal

screen for cervical cancer, whereas in other cases, such as follow-up care for an abnormal prostate specific antigen (PSA) test, Veterans may need to seek care outside of VA. These differences seen across low-value services may have implications when considering policies associated with dual healthcare system use in Veterans.

Similar to prior work in other clinical areas and patient populations, we found that care cascade services consisted mostly of repeat testing and related follow-up testing rather than a definitive procedure, such as an ablative cervical procedure.^{3,5–8} Unlike other low-value services, the principle of overdiagnosis may not apply to cervical cancer. For example, in the case of PSA testing in older adults, the over-detection and overtreatment of indolent prostate cancers do not improve survival as these men are likely to die from causes other than their prostate cancer.²⁴ In contrast, for selected patients in our cohort, especially those who did not have appropriate prior screening, the cervical cancer screening may have revealed a meaningful finding and resulted in indicated follow-up services. As with all low-value service metrics, utilizing standardized algorithms may misclassify patients for whom testing should be performed outside of clinical guidelines.²⁵ Thus, we must exercise caution when interpreting these results and applying them clinically, being careful to weigh both measured and unmeasured benefits and harms in each individual patient and to engage in shared decision-making. This may also suggest that guidelines should be further refined to incorporate more nuanced patient characteristics and preferences rather than relying solely on factors such as age cutoffs.

Limitations

Our study has several important limitations. In using a claims-based approach, we were unable to capture more granular aspects of care such as patient and provider shared decision-making regarding cervical cancer screening. Additionally, due to data limitations and the fact that Veterans in our cohort may have received care outside of VA prior to enrolling in Medicare, we were not able to capture if Veterans had adequate prior cervical cancer screening. Thus, we may have over-captured tests as being low value. However, by requiring that Veterans in our cohort had a face-to-face primary care or gynecology visit in FY2017, we hope to exclude those who had long gaps in care and had indicated screening upon entering back into care. Similarly, we were not able to definitively determine if downstream services occurred as a result of the initial test. However, consistent with prior studies, we utilized a control group to account for the baseline level of care occurring in the study sample.

CONCLUSIONS

The findings of this retrospective cohort study of older Veterans dually enrolled in VA and Medicare demonstrate that although low-value cervical cancer screening occurs relatively infrequently within VA, Veterans commonly experience related downstream tests, visits, and procedures because of the initial screening. A greater understanding of the full burden that Veterans experience due to low-value cervical cancer screening, especially compared to other low-value services, may inform policies and interventions aimed at reducing low-value care and the development of low-value performance measures.

AUTHOR CONTRIBUTIONS

Concept and design: Pickering, Zhao, Gellad, Fine, Thorpe, Radomski. Acquisition, analysis, and interpretation of data: Pickering, Zhao, Sileanu, Lovelace, Rose, Schwartz, Hale, Schleiden, Gellad, Fine, Thorpe, Radomski. Drafting of the manuscript: Pickering. Critical revision of the manuscript for important intellectual content: Pickering, Zhao, Sileanu, Lovelace, Rose, Schwartz, Hale, Schleiden, Gellad, Fine, Thorpe, Radomski. Statistical Analysis: Pickering, Zhao, Sileanu, Lovelace. Obtaining funding: Thorpe. Administrative, technical, or material support: Hale, Schleiden, Fine, Thorpe, Radomski. Supervision: Pickering, Thorpe, Radomski.

CONFLICT OF INTEREST STATEMENT

Dr. Pickering received grants from the University of Pittsburgh Claude D. Pepper Older Americans Independence Center outside the committed work. Dr. Zhao received grants from the US Department of Veterans Affairs (VA) during the conduct of the study. Ms. Sileanu received grants from the VA during the conduct of the study. Mr. Lovelace received grants from the VA during the conduct of the study. Dr. Rose received grants from the VA during the conduct of the study. Dr. Schwartz is supported by Career Development Award IK2HX003634 from the US Department of Veterans Affairs (Office of Research and Development) and has received prior personal fees from the Lown Institute, the Tufts University School of Medicine, CVS Health, VBI Health, and the Medicare Payment Advisory Commission outside the submitted work. Dr. Gellad received grants from the VA during the conduct of the study and personal fees from SAGE for activities outside the submitted work. Dr. Fine received grants from the VA during the conduct of the study. Dr. Thorpe received grants from the VA during the conduct of the study, and grants from the National Institutes of Health outside the submitted work, and personal fees from SAGE Publications, Inc. outside the

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The funding source had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Supplementary Table 1. Cohort inclusion and exclusion criteria, index low-value cervical cancer screening, and cascade services with relevant administrative codes.

Supplementary Table 2. Standardized mean differences (SMD) for baseline patient- and facility-level characteristics in Veterans who underwent low-value cervical cancer screening and those who did not before and after inverse probability of treatment weighting.

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