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RESEARCH BRIEF

## Location of Cancer Surgery for Older Veterans with Cancer

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**Objective.** Many veterans undergo cancer surgery outside of the Veterans Health Administration (VHA). We assessed to what extent these patients obtained care in the VHA before surgery.

**Data Sources.** VHA-Medicare data, VHA administrative data, and Veterans Affairs Central Cancer Registry data.

**Study Design.** We identified patients aged  $\geq 65$  years in the VHA-Medicare cohort who underwent lung or colon cancer resection outside the VHA and assessed VHA visits in the year before surgery.

**Principal Findings.** Over 60% of patients in the VHA-Medicare cohort who received lung or colon cancer surgeries outside the VHA did not receive any care in VHA before surgery.

**Conclusions.** Veterans' receipt of major cancer surgery outside the VHA probably reflects usual private sector care among veterans who are infrequent VHA users.

**Key Words.** Veterans, cancer surgery, Medicare, health services

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Many older veterans who are eligible for care in the Veterans Health Administration (VHA) also receive care in the private sector through Medicare (Fleming et al. 1992; Weeks et al. 2002, 2003; Ashton et al. 2003; Hynes et al. 2007). Studies examining health care utilization among veterans with dual eligibility for VHA and Medicare services have shown an increasing proportion of veterans relying on Medicare for care (Wright et al. 1999; Shen et al. 2005). In 2003 and 2004, among veterans eligible for both VHA and Medicare services who were hospitalized, 63% received inpatient care from Medicare only, 26% received inpatient care from VHA only, and 11% received care from both Medicare and the VHA (Petersen et al. 2010).

Prior studies have found that up to 70% of VHA users hospitalized for acute myocardial infarction and 76% of patients hospitalized for stroke were admitted to non-VHA hospitals, which may reflect greater access to non-VHA

hospitals during an acute illness, where proximity is important (Wright et al. 1999; Shen et al. 2008). Veterans also receive substantial elective care outside the VHA. In a recent study, West and colleagues reported that more than three-quarters of older veterans undergoing elective high-risk surgeries underwent surgery in non-VHA hospitals under Medicare (West, Weeks, and Wallace 2008). However, because they studied veterans eligible for VHA care rather than VHA users, it is not clear whether the high rates of elective surgery outside of the VHA among their population reflected a desire of regular VHA users to obtain certain services, such as high-risk surgery, outside the VHA or whether their VHA cohort primarily consisted of veterans who received *very little* or *no* care from the VHA. If VHA users are choosing to obtain care outside the VHA, it would suggest that the VHA is not meeting their needs, in which case this could be an area of focus to assure better access to care and better coordination of care for VHA users.

In this study, we attempted to differentiate between these two options using a more comprehensive approach to identifying veterans who were active users of the VHA system versus those who were not. We studied patients with lung cancer or colorectal cancer for this purpose.

## METHODS

### *Data Sources*

*VHA-Medicare File.* The VHA-Medicare file contains administrative data for all Medicare-reimbursed care, including admissions to private sector hospitals, by veterans who are *potentially eligible* for VHA services (Hynes et al. 2007; West and Weeks 2007, 2009). The VHA-Medicare file allows for ascertainment of care covered under Medicare *only* and not care delivered in the VHA. We used VHA-Medicare data from 2000 to 2005.

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*VHA Administrative Data.* We used VHA administrative data from the Patient Treatment File and the Outpatient Clinic File to ascertain outpatient visits and treatments received.

*Veterans Affairs Central Cancer Registry (VACCR) data.* Since 2001, the VACCR identifies all patients with cancer who were diagnosed and/or received their first course of treatment in a VHA facility (including surgery, radiation, or chemotherapy; 92% of colorectal cancer patients, and 90% of lung cancer patients were diagnosed at the VHA facility that reported their cancer). In addition, tumor registrars from each VA medical center actively track veterans they have identified with cancer, who are treated outside VHA facilities, and treatments received at non-VHA hospitals are included in the registry data. We linked VACCR data from 2001 to 2004 with VHA administrative data and Medicare data through 2005 to ascertain treatments received, including cancer surgery, both in the VHA and treatments received outside of the VHA and covered under Medicare.

### *Cohort Identification*

We identified two patient cohorts.

*VHA-Medicare Cohort.* On the basis of the methods of West, Weeks, and Wallace (2008), we used the VHA-Medicare cohort (see [www.virec.research.va.gov/DataSourcesName/VA-CMS/VACMSbackground.htm](http://www.virec.research.va.gov/DataSourcesName/VA-CMS/VACMSbackground.htm) last accessed September 1, 2011) to identify all men and women aged  $\geq 65$  years who had a Medicare claim for an inpatient admission with an ICD-9 diagnosis code for lung cancer (162.0–165.9) and an ICD-9 procedure code for lung lobectomy (32.4) or pneumonectomy (32.5) or who had an ICD-9 diagnosis code for colon cancer (153–153.9, 154.0) and an ICD-9 procedure code for colon resection (45.73–45.76) during 2000–2005. Of note, the VHA-Medicare cohort includes veterans who (1) have obtained health care services from the VHA since 1992, or (2) have enrolled in the VHA, or (3) are receiving compensation or pension benefits from the Department of Veterans Affairs. Veterans are never removed from the VHA cohort, even if they never use VHA services and become ineligible or die. As of 2008, the VHA cohort included 14,506,025 individuals.

*VACCR Cohort.* Our second cohort included patients from the VACCR aged  $\geq 65$  years who were diagnosed or received their first course of treatment for lung or colon cancer in the VHA during 2001–2004. We used this VACCR cohort to assess location of surgery for patients included in the VACCR (who were diagnosed and/or received their first course of treatment in the VHA). We identified patients with stage I/II lung cancer or I/II/III colon cancer for whom resection is recommended.

### *Analysis*

To ascertain whether patients in our VHA-Medicare cohort were receiving regular care in the VHA, we identified face-to-face office visits with internists or nurse practitioners in the VHA during the year before surgery using codes from the Healthcare Common Procedure Coding System (Table S1) and assessed receipt of primary care and specialty care using VHA clinic codes (Table S2). We also counted the number of primary care visits in the year before cancer surgery to further ascertain whether patients were receiving regular care in the VHA prior to their cancer resection. By identifying the extent to which veterans in our cohort were active users of the VHA system in the year prior to their cancer surgery, we were able to differentiate between regular VHA users who received their surgery outside of the VHA versus potentially eligible veterans who never received care in the VHA.

For our VACCR cohort, we used the ICD-9 procedure codes described above to ascertain surgery. Location of surgery was classified based on source of payment and was categorized as in the VHA, contracted care delivered outside of the VHA, but paid for by the VHA, or outside of the VHA and covered by Medicare. As  $<1\%$  of surgeries were contracted care delivered outside the VHA, and these surgeries were paid by the VHA, this category was considered care in the VHA. This analysis allowed us to determine how often patients who were already part of the VHA system (based on having their cancers diagnosed and/or receiving first course of treatment) were getting cancer surgery outside the VHA.

We also compared site of care by patient age, year of diagnosis, service connection, and distance from the patient's zip code to the diagnosing VHA facility using chi-square tests. Veterans with more severe service-connected disabilities are eligible for more benefits with lower out-of-pocket expenses and are more likely to rely on the VHA for their care than veterans in lower priority groups (Hynes et al. 2007).

Table 1: Outpatient Visits to Veterans Health Administration (VHA) Providers during the Year before Surgery among Patients Who Underwent Cancer Surgery outside the VHA

|                       | <i>Colon Cancer</i><br>( <i>N</i> = 31,368), % | <i>Lung Cancer</i><br>( <i>N</i> = 13,479), % |
|-----------------------|--|---|
| No visits             | 61.5   | 57.2  |
| Visits other than PCP | 1.6  | 1.5   |
| 1–2 PCP visits        | 24.2   | 26.9  |
| 3+ PCP visits         | 12.7   | 14.4  |

PCP, primary care physician.

## RESULTS

The VHA-Medicare cohort included 44,847 veterans in the VHA-Medicare file who underwent lung cancer or colon cancer surgery outside the VHA between 2000 and 2005. The distribution of VHA face-to-face visits during the year before cancer surgery for these patients is presented in Table 1. Most patients (61.5% of colon cancer patients and 57.2% of lung cancer patients) had no visits in the VHA during the year before their cancer surgery, and very few had more than three visits with a primary care provider.

Among patients in the VACCR cohort (patients who were diagnosed in the VHA and/or received their first course of treatment in the VHA) who underwent colon or rectal cancer resection, 4.1% of colorectal cancer patients had surgery outside the VHA covered by Medicare, and 5.8% of lung cancer patients had surgery outside the VHA. Table 2 depicts the proportion of patients in the VACCR who had surgery outside the VHA covered by Medicare stratified by age, year, service-connected disability, and distance from the nearest VHA facility. The proportion of patients in the VACCR who received their cancer surgeries outside the VHA did not differ by patient age, year of diagnosis, service connection, or distance to VHA facility.

## DISCUSSION

A recent study reported that 82% of veterans with lung cancer and 78% of veterans with colon cancer received their cancer resections outside the VHA (West, Weeks, and Wallace 2008). However, it has been unclear to what extent

Table 2: Patient Characteristics and Location of Surgery for Patients in Veterans Affairs Central Cancer Registry Cohorts

|   | Colon Cancer (N = 4,017) |   |          | Lung Cancer (N = 1,521) |   |          |
|---|--------------------------|---|----------|-------------------------|---|----------|
|   | N                        | % Surgery<br>Out of VHA<br>Covered<br>by Medicare | p Value* | N                       | % Surgery<br>Out of VHA<br>Covered<br>by Medicare | p Value* |
| Age                                       |                          |   |          |                         |   |          |
| 65–69                                     | 832                      | 4.0   | .97      | 514                     | 4.1   | .12      |
| 70–74                                     | 1,098                    | 4.3   |          | 478                     | 6.5   |          |
| 75–79                                     | 1,097                    | 4.2   |          | 383                     | 6.3   |          |
| 80+                                       | 990                      | 3.9   |          | 146                     | 8.9   |          |
| Year                                      |                          |   |          |                         |   |          |
| 2001                                      | 1,001                    | 4.9   | .53      | 360                     | 6.9   | .32      |
| 2002                                      | 1,037                    | 3.9   |          | 390                     | 6.9   |          |
| 2003                                      | 1,029                    | 3.7   |          | 393                     | 4.3   |          |
| 2004                                      | 950                      | 4.0   |          | 378                     | 5.3   |          |
| Service-connected disability <sup>†</sup> |                          |   |          |                         |   |          |
| None                                      | 2,682                    | 4.5   | .11      | 1,041                   | 5.0   | .16      |
| <10%                                      | 190                      | 5.3   |          | 63                      | 9.5   |          |
| 10%–40%                                   | 573                      | 3.1   |          | 224                     | 7.1   |          |
| ≥ 50%                                     | 556                      | 3.3   |          | 189                     | 7.9   |          |
| Distance from VHA facility                |                          |   |          |                         |   |          |
| <30 miles                                 | 2,313                    | 3.9   | .62      | 716                     | 4.9   | .12      |
| 30–60 miles                               | 738                      | 4.7   |          | 334                     | 8.1   |          |
| >60 miles                                 | 966                      | 4.0   |          | 471                     | 5.7   |          |

Notes.\*Using the chi-square test.

<sup>†</sup>Numbers do not sum to total because data about service-connected disability were missing for 16 patients with colon cancer and four patients with lung cancer.

VHA, Veterans Health Administration.

this reflects a choice to undergo cancer treatment outside the VHA among patients who are being cared for in the VHA, or whether it represents usual care for veterans who are not users of VHA care. It is important to know where dually eligible veterans receive care to understand if the VHA is meeting the needs of eligible veterans. In addition, as care in multiple systems may be poorly coordinated, understanding the extent and types of care obtained outside the VHA can help to identify opportunities for improving coordination and quality of care.

Among veterans who underwent lung or colon cancer surgery outside the VHA, we assessed visits in the VHA during the year before surgery and found that most of these veterans had no outpatient visits in the VHA during that time. In contrast, among patients identified by the VACCR, who had

their cancers diagnosed and/or received their first course of treatment in the VHA, the vast majority received their cancer surgery in the VHA. These findings were similar despite proximity to VHA facilities or levels of service-connected disability among our veterans. Thus, our findings suggest that although most veterans have cancer surgery outside the VHA, nearly all VHA patients diagnosed with cancer in the VHA have their cancer surgery in the VHA.

Veterans who are eligible for Medicare have a choice of where to obtain health care services. Many factors including gender (Hoff and Rosenheck 2000; Weaver et al. 2003; Liu, Maciejewski, and Sales 2005), age (Wright et al. 1997; Hynes et al. 1998; Liu, Maciejewski, and Sales 2005), clinical condition for which care is sought (Petersen et al. 2010), residence in an urban or rural area (Mooney et al. 2000; Weeks et al. 2005), distance from a VHA facility (Burgess and DeFiore 1994; Lahiri and Xing 2004), VA priority status (Hynes et al. 2007), and requirements for copayments (Smith et al. 1996) have been shown to influence use of VHA care among veterans. Even though frequent use of non-VHA hospitals by veterans has been reported in a number of studies (Fleming et al. 1992; Wright et al. 1997; Wright et al. 1999; Weeks et al. 2004; Weeks et al. 2005; Hynes et al. 2007; West and Weeks 2007), many of these studies either focused on acute myocardial infarction or stroke (Wright et al. 1997; Wright et al. 1999; Weeks et al. 2006; Shen et al. 2008), where immediate access to the nearest hospital may be crucial, or studied patients in the VHA cohort (Hynes et al. 2007; West and Weeks 2007, 2009; West, Weeks, and Wallace 2008), which includes patients who are eligible for VHA services but who do not necessarily ever use them. Our findings suggest that high use of elective cancer surgery identified by others (West, Weeks, and Wallace 2008) probably represents use of non-VHA care by veterans who receive none or very little regular care from the VHA.

Our findings should be interpreted in light of some limitations. First, we focused only on patients aged 65 and older with lung or colon cancer who underwent surgical resection, and so the generalizability of our findings to younger patients and those with other conditions requires further study. Second, we used the VHA-Medicare cohort to identify patients who had their cancer surgery reimbursed by fee-for-service Medicare. As this cohort was defined based on having surgery in Medicare, it included only patients who underwent a cancer surgery reimbursed by Medicare, and thus did not include patients who may have been eligible for the VHA cohort, but underwent lung or colon resections in the VHA. To address this limitation, we complemented the analysis with data from the VACCR cohort (which includes patients who

were diagnosed and/or received their first course of cancer treatment in the VHA), and we found that very few of these patients underwent cancer surgery outside the VHA. Third, we did not have information on veterans' income and priority group designation for receipt of services. We used service connection disability designations as a proxy for priority to receive VHA services. However, as a large proportion of our sample consisted of veterans with no service-connected disabilities, we did not find an association between the level of service connection and the location of care.

In conclusion, although large numbers of older veterans with lung or colon cancer undergo major cancer surgery outside the VHA, these are primarily patients who are not regular users of VHA care at the time of their cancer surgery. Moreover, those with cancers diagnosed in the VHA infrequently undergo resections of their cancers outside the VHA. Thus, the high frequency of non-VHA care used by veterans most probably reflects an overall choice to receive most or all of their care outside the VHA rather than a desire of veterans being cared for in the VHA system to receive certain high-complex treatments outside the VHA. Additional data collection from veterans receiving care outside the VHA could be useful to understand how the VHA can serve the needs of eligible veterans better. In addition, future studies investigating patterns of health care use among older veterans should examine the extent to which these veterans are utilizing other VHA services.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Table S1: Health Care Common Procedure Coding System (HCPCS) Codes for Face-to-Face-Office Visits.

Table S2: Clinic Stop Codes Used to Identify Primary Care and Specialty Care.

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