Robot-assisted Surgery for Esophageal Cancer Data Companion

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PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to provide timely and accurate syntheses of targeted healthcare topics of importance to clinicians, managers, and policymakers as they work to improve the health and healthcare of Veterans. These reports help:

- Develop clinical policies informed by evidence;
- Implement effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures; and
- Set the direction for future research to address gaps in clinical knowledge.

The program comprises three ESP Centers across the US and a Coordinating Center located in Portland, Oregon. Center Directors are VA clinicians and recognized leaders in the field of evidence synthesis with close ties to the AHRQ Evidence-based Practice Center Program. The Coordinating Center was created to manage program operations, ensure methodological consistency and quality of products, and interface with stakeholders. To ensure responsiveness to the needs of decision-makers, the program is governed by a Steering Committee composed of health system leadership and researchers. The program solicits nominations for review topics several times a year via the program website.

Comments on this report are welcome and can be sent to Nicole Floyd, Deputy Director, ESP Coordinating Center at Nicole.Floyd@va.gov.

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BACKGROUND

Esophageal cancer is the seventh most common type of cancer and has the sixth highest mortality rate worldwide.[1] Esophagectomy is often a critical component in treatment for esophageal cancer[2] and can be performed using open, conventional minimally invasive techniques (thoracoscopic and laparoscopic), or robot-assisted approaches. In 2016, there were over 1,800 robotic esophagectomies performed worldwide, a 9-fold increase from those performed in 2009.[3]

In 2020, the Department of Veterans Affairs (VA) Evidence Synthesis Program (ESP) published a systematic review comparing the clinical- and cost-effectiveness of the robot-assisted minimally invasive (RAMIE) approach to both the video-assisted minimally invasive esophagectomy (VAMIE; *ie*, via laparoscopy, thoracoscopy) approach and to open surgery. The systematic review included 22 publications and concluded with moderate certainty of evidence (COE) that compared to VAMIE, RAMIE showed no difference in anastomotic leaks, total complications, or short-term mortality. Compared to open surgery, they found high COE that RAMIE is associated with a longer operative time, but lower estimated blood loss (EBL). They also found moderate COE of greater lymph node harvest, a lower rate of pulmonary complications, fewer total complications, and no difference in anastomotic leak or recurrent laryngeal nerve (RLN) palsy. For other outcomes the COE was considered low or very low due to study limitations, imprecision, inconsistency, and paucity of data. Investigators identified no studies evaluating cost-effectiveness, and none of the included studies were performed in Veterans Health Administration (VHA) settings.[4]

Compared to the general US population and to Veterans ineligible for VA health care benefits, those served by the VHA tend to be older, and are more likely to experience both single and multiple chronic conditions,[5,6] have a mental health condition,[7] and to live in rural communities with limited access to health care and other services.[8] As such, Veterans are a unique population that are not specifically represented in studies outside VHA settings. Given the lack of studies conducted in the VHA, the applicability of findings from the published literature to Veterans served by the VHA may be limited.

We sought to augment the findings from the ESP systematic review of the published literature by analyzing VHA administrative and registry data. In this study, we examined these data to understand how utilization of RAMIE has changed over time, and explored whether clinical outcomes differ as compared to VAMIE and open surgical approaches.

METHODS

TOPIC DEVELOPMENT

This topic was developed as a follow-up to a 2020 ESP report examining the clinical- and cost-effectiveness of robot-assisted surgery for esophageal cancer.[4]

The Key Questions (KQs) for this data analysis were:

KQ1. What were the national and regional utilization trends of robot-assisted surgery for esophageal cancer in the VHA between January 2015 and December 2019?

KQ2. Between January 2015 and September 2019, how were clinical outcomes in the VHA similar or different for robot-assisted versus laparoscopic/thoracoscopic and open surgical approaches for esophageal cancer?

DATA SOURCES

VA Corporate Data Warehouse (CDW)

The VHA's Corporate Data Warehouse (CDW) is a centralized relational data architecture comprising data from several VHA clinical and administrative systems.[9-11] CDW includes data from Veterans Information System Technology Architecture (VistA) and the VHA's electronic health record (EHR) system, from 1999 to the present, including all inpatient and outpatient surgical procedures. Inpatient procedures are coded using both International Classification of Diseases (ICD) procedure codes, and Current Procedural Terminology (CPT) codes. Outpatient procedures are coded using CPT and Healthcare Common Procedure Coding System (HCPCS) codes and modifiers.[12]

Observational Medical Outcomes Partnership (OMOP)

The Observational Medical Outcomes Partnership (OMOP) is a concept-based community-supported common data model (CDM).[8] A CDM uses standardized terminology and vocabularies to allow for collaborative research and analysis across health information sources and health systems.[13] The Department of Veterans Affairs' VA Informatics and Computing Infrastructure (VINCI) began to transform CDW data into OMOP in 2015. Data transformation processes are described elsewhere.[14]

VA Surgical Quality Improvement Plan (VASQIP)

The VA Surgical Quality Improvement Plan (VASQIP) contains surgical quality data related to the procedures and select outcomes within 30 days of the procedure. Trained VASQIP nurses review electronic medical records to abstract detailed perioperative variables for each VASQIP case. Higher-volume cases are limited to no more than 5 per 8-day abstraction cycle. Data are limited to a maximum of 36 per 8-day cycle. VASQIP data include CPT procedure codes. Description of VASQIP data and methods have been described elsewhere.[15]

CASE IDENTIFICATION

Case Identification for Key Question 1

We identified all esophagectomies performed in VHA facilities from January 1, 2015 through December 31, 2019. We accessed CDW data using the OMOP procedure occurrence table. Annual datasets for CDW are released by calendar year. See Table 1 for a list of included CPT codes.

In cases where more than 1 CPT code indicated the same procedure, only 1 case was counted. If the CPT codes were for different procedures (*eg*, transthoracic esophagectomy and transhiatal esophagectomy), we counted them as separate cases (see Table 2 for detail).

Classification of Robot-assisted Procedures

We identified robot-assisted procedures by the addition of Healthcare Common Procedure Coding System (HCPCS) code S2900 to the CPT code.

Table 1. ICD and CPT Codes for Case Identification

Surgical Approach	CPT Codes	ICD-9	ICD-10
Open	43107, 43108, 43112, 43113, 43116, 43117, 43118, 43121, 43122, 43123, 43124	42.4, 42.40, 42.41, 42.42, 42.5, 42.52, 42.62	0DT50ZZ, 0DT10ZZ, 0DT20ZZ, 0DT30ZZ
Laparoscopic and Thoracoscopic	43286, 43287, 43288 - or - Any open code + 43289 or 49320	Any open code + 54.21	0DT54ZZ, 0DT14ZZ, 0DT24ZZ, 0DT34ZZ
Robot-Assisted	Any open, laparoscopic, or thoracoscopic code + S2900	17.41, 17.42, 17.43, 17.44, 17.45, 17.49	8E0W0CZ, 8E0W3CZ, 8E0W4CZ, 8E0WXCZ

Abbreviations. CPT=current procedural terminology; ICD=international classification of disease

Case Identification for Key Question 2

To examine outcomes associated with robot-assisted esophagectomies, we started with the cases we included for KQ1, and identified those that were included in VASQIP. Annual datasets for VASQIP are released by fiscal year; thus, VASQIP data were available through September 30, rather than December 31, 2019.

We excluded cases that were flagged as emergent procedures, associated with patients with more than 1 procedure on the same procedure date, those for which the surgical approach was unclear, and those that had an operative time considered implausible by clinical experts (*eg*, less than 100 minutes; see Table 2 for detail).

Table 2. Case Identification Criteria by Key Question

	KQ1: Robot Utilization	KQ2: Outcomes Associated with Robot-Assisted Surgery
Data Source	CDW/OMOP	VASQIP
Inclusion	See Table 1	KQ1 cases that identified via CPT code that were included in VASQIP

Exclusion	Cases missing a VHA facility as the procedure location	Cases flagged as an emergent procedure Cases associated with patients with more than 1 procedure on the same procedure date. Cases with documented operative times of fewer than 100 minutes Cases with documented postoperative length of stays of fewer than 3 days

Note. VASQIP does not include ICD codes.
Abbreviations. CDW=Corporate Data Warehouse; KQ=key question; ICD=international classification of disease; OMOP=Observational Medical Outcomes Partnership; VASQIP=VA Surgical Quality Improvement Plan

Patient Characteristics

For KQ2, we included gender, age (in years), race, ethnicity, current smoking, body mass index (BMI), and preoperative hospital length of stay (LOS; in days). Patient characteristics were recorded at the time of the surgical procedure. We assumed that each case was independent; if a Veteran had the same procedure more than once during the study period, they are represented more than once in Table 4. BMI outliers were determined using the IQR method (lower bound of Q1-1.5*IQR, upper bound of Q3 + 1.5*IQR). BMI values beyond the lower and upper bounds were excluded from the BMI analysis.

OUTCOMES

For KQ2, we examined the following intraoperative and post-surgical outcomes: operative time, postoperative hospital LOS, systemic sepsis, myocardial infarction, blood loss requiring greater than 4 units of blood, pneumonia, pulmonary embolism, postoperative acute renal failure, superficial surgical site infection, 30-day mortality, and presence of at least 1 of 23 postoperative VASQIP outcomes (see Appendices A and B for definitions).

ANALYSES

For KQ1, we used χ^2 analysis to compare the proportion undergoing each surgical approach for esophagectomy. For example, the proportion of RAMIEs were compared with the proportion of open esophagectomies. *P*-values < 0.05 were considered statistically significant.

For KQ2, we used χ^2 tests for differences in proportions of outcomes by surgical approach and Fisher's exact test for differences in proportions among cells with an expected count of less than 5. Relative differences in postoperative LOS (IRR) by surgical approach were compared using unadjusted negative binomial regression, specifying nested correlation structures (patients within hospitals). Relative differences in operative time by surgical approach (IRR) were compared using unadjusted gamma regression, specifying a log link and nested correlation structures (patients within hospitals). Due to very few RAMIE observations, Fisher's exact test was used to compare differences in proportions in preoperative LOS categories (0-1 days, 2-5 days, and greater than 5 days). The clinical outcomes data were descriptive; we did not adjust for confounding covariates. All analyses were performed using the FREQ and GENMOD procedures in SAS Enterprise Guide 8.2 using two-sided tests and an alpha of 0.05.

This study examined VHA administrative data. It was approved by the VHA Institutional Review Board in Portland, OR (IRB Exempt Study #04584).

RESULTS

KQ1. What were the national and regional utilization trends of robot-assisted surgery for esophageal cancer in the VHA between January 2015 and December 2019?

We identified a total of 1,134 unique esophagectomies meeting inclusion criteria, of which 4.1% were robot-assisted. From 2015 to 2019, RAMIEs increased from 10 of 357 esophagectomies (2.8%) to 18 of 151 (11.92%). Similarly, VAMIE increased from 28 of 357 esoophagectomies in 2015 (7.84%) to 42 of 151 in 2019 (27.81%). There was a concurrent decline in the proportion of open esophagectomies (see Table 3 and Figures 1 and 2). During the same period, the total number of esophagectomies decreased by nearly 60% (see Table 3 and Figure 2).

We were unable to examine regional trends due to the limited number of esophagectomies per year.

Table 3. Esophagectomies by Surgical Approach: 2015 to 2019

	2015	2016	2017	2018	2019	*Total*
Open	319 (89.36%)	190 (85.59%)	175 (84.13%)	138 (70.41%)	91 (60.26%)	*913*
VAMIE	28 (7.84%)	27 (12.16%)	24 (11.54%)	54 (27.55%)	42 (27.81%)	*175*
RAMIE	10 (2.8%)	5 (2.25%)	9 (4.33%)	4 (2.04%)	18 (11.92%)	*46*
Total	*357*	*222*	*208*	*196*	*151*	*1134*

Abbreviations. RAMIE=robot-assisted minimally invasive esophagectomy; VAMIE=video-assisted minimally invasive esophagectomy

Figure 1. Longitudinal Trends in Esophagectomies by Surgical Approach: 2015 to 2019

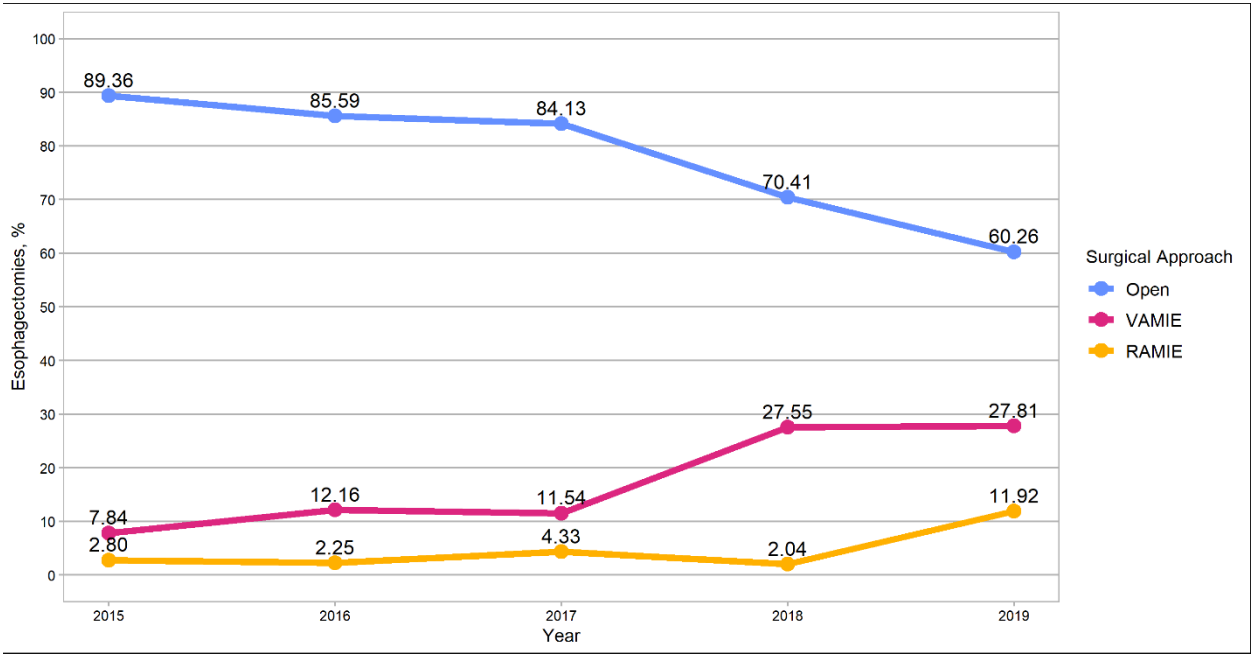
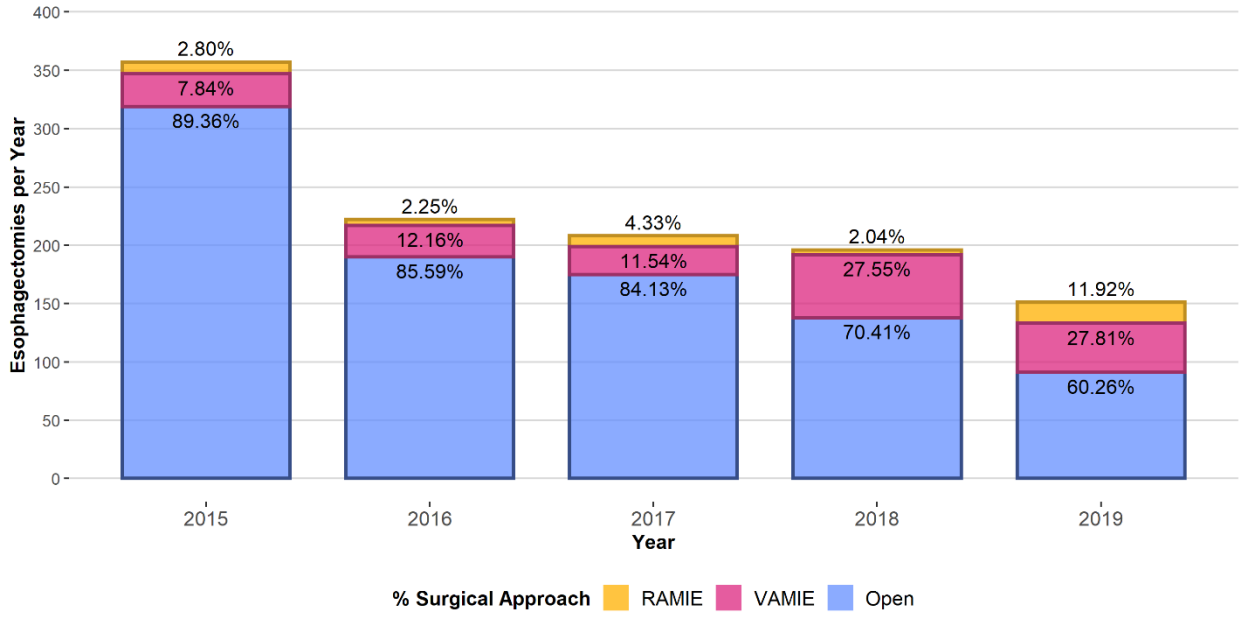


Figure 2. Esophagectomies by Surgical Approach: 2015 to 2019



Abbreviations. RAMIE=robot-assisted minimally invasive esophagectomy; VAMIE=video-assisted minimally invasive esophagectomy

KQ2. Between January 2015 and September 2019, how were clinical outcomes in the VHA similar or different for robot-assisted versus laparoscopic/thoracoscopic and open surgical approaches for esophageal cancer?

Between January 2015 and September 2019, 688 esophagectomies in VASQIP met inclusion criteria. Table 4 provides patient characteristics by procedure and surgical approach. Overall, included Veterans were predominantly White males with a mean age between 65 and 68 years.

Table 4. Patient Characteristics by Surgical Approach

		RAMIE	VAMIE	Open
Patient Characteristic		*n = 30*	*n = 63*	*n = 595*
Sex	**Female, *n* (%)**	<11 (<36.67)	0	<11 (<1.85)
	Male, *n* (%)	>19 (>63.33)	63 (100)	>584 (>98.15)
Age	**Mean (SD)**	67.87 (5.08)	67.14 (8.26)	65.38 (7.92)
Ethnicity	**Hispanic or Latino, *n* (%)**	<11 (<36.67)	<11 (<17.46)	23 (3.87)
	Not Hispanic or Latino, *n* (%)	>19 (>63.33)	57 (90.48)	558 (93.78)
	Declined to Answer or Unknown by Patient, *n* (%)	<11 (<36.67)	<11 (<17.46)	14 (77.78)
Race	**Black or African American, *n* (%)**	<11 (<36.67)	<11 (<17.46)	44 (7.39)
	White, *n* (%)	>19 (>63.33)	50 (79.37)	509 (85.55)
	AAPI, AI, AN, NH, *n* (%)	0	<11 (<17.46)	<11 (<1.85)
	Declined to Answer or Unknown by Patient, *n* (%)	<11 (<36.67)	<11 (<17.46)	32 (84.21)
Smoking Status	**Smoker, *n* (%)**	9 (30.00)	15 (23.81)	203 (34.12)
BMI	**Mean (SD)**	25.86 (5.45)	27.49 (5.24)	26.98 (5.2)

Notes. Data are coarsened to protect Veteran privacy.[16]
Abbreviations. AAPI=Asian American Pacific Islander; AI=American Indian; AN=Alaskan Native; BMI=body mass index; NH=Native Hawaiian; RAMIE=robot-assisted minimally invasive esophagectomy; SD=standard deviation; VAMIE=video-assisted minimally invasive esophagectomy

Operative Times

Compared to RAMIE, operative times for VAMIE and open surgery were significantly shorter (IRR [SE] = 0.82 [0.06], 95% CI [0.70, 0.95] and IRR [SE] = 0.78 [0.05], 95% CI [0.68, 0.88] respectively). Mean operative times were between 6 and 7 hours for Veterans who had an open esophagectomy or VAMIE, and were more than 8 hours for those who had RAMIE (see Table 5).

Table 5. Uncontrolled Operative Times (Hours) by Surgical Approach

Procedural Approach	Mean (SD)	IRR (SE)	95% CI
Open	6.32 (2.35)	0.78 (0.05)	0.68, 0.88
VAMIE	6.64 (2.39)	0.82 (0.06)	0.70, 0.95

RAMIE	8.14 (2.91)	REF	REF

Abbreviations. CI=confidence interval; IRR=incidence rate ratio; RAMIE=robot-assisted minimally invasive esophagectomy; REF=reference group; SD=standard deviation; SE=standard error; VAMIE=video-assisted minimally invasive esophagectomy

Postoperative Length of Stay (LOS)

Mean postoperative LOS ranged from M(SD) = 13.77 (9.05; RAMIE) to 16.12 (11.07; open surgery). However, there was no significant difference by approach. Table 6 provides detail.

Table 6. Unadjusted Postoperative Length of Stay (Days) by Surgical Approach

Procedural Approach	Mean (SD)	IRR (SE)	95% CI
Open	16.12 (11.07)	1.17 (0.14)	0.92, 1.49
VAMIE	14.92 (8.76)	1.08 (0.15)	0.83, 1.42
RAMIE	13.77 (9.05)	REF	REF

Abbreviations. CI=confidence interval; IRR=incidence rate ratio; RAMIE=robot-assisted minimally invasive esophagectomy; REF=reference group; SD=standard deviation; SE=standard error; VAMIE=video-assisted minimally invasive esophagectomy

Surgical Complications

Across the 3 surgical approaches, roughly a third of Veterns reported at least 1 of the complications included in VASQIP (see Appendix B for a complete list, including definitions). Pneumonia was reported by 14.8% of Veterans who had open esophagectomies. Further, of those who underwent open esophagectomy, 10.8% experienced systemic sepsis, 3.5% reported surgical site infections, and 30-day mortality was 3.4%. Rates of all other complications were low (see Table 7).

Table 7. Intraoperative and Postoperative Outcomes by Approach, Unadjusted

Outcome	RAMIE	VAMIE	Open
Systemic Sepsis, *n* (%)	2 (6.7%)	4 (6.3%)	64 (10.8%)
Myocardial Infarction, *n* (%)	--	--	4 (0.7%)
Bleeding (req >4 units), *n* (%)	--	--	1 (0.2%)
Pneumonia, *n* (%)	**--**	**5 (7.9%)**	**88 (14.8%)**
Pulmonary Embolism, *n* (%)	--	1 (1.6%)	17 (2.9%)
Post-Op. Acute Renal Failure, *n* (%)	--	1 (1.6%)	5 (0.8%)
Superficial Surgical Site Infection, *n* (%)	1 (3.3%)	1 (1.6%)	21 (3.5%)
1+ VASQIP Complication, *n* (%)	5 (16.7%)	21 (33.3%)	223 (37.5%)
30-Day Mortality, *n* (%)	--	2 (3.2%)	20 (3.4%)

Note. Bolded values indicate significant differences between groups, $p<0.05$.
Abbreviations. RAMIE=robot-assisted minimally invasive esophagectomy; req=requiring; VAMIE=video-assisted minimally invasive esophagectomy; VASQIP = Veterans Affairs Surgical Quality Improvement Program

DISCUSSION

Our findings suggest that the proportion of RAMIEs in VHA settings remained relatively stable between 2015 and 2018, and increased in 2019. Over the study period we saw a gradual increase in the proportion of laparoscopic and thoracoscopic procedures (VAMIE), and a concurrent decline in the proportion of open esophagectomies. However, during the same period, the total number of esophagectomies decreased by 57.7%, with the steepest decline between 2015 and 2016.

We found that the overall number of esophagectomies decreased over time. It is unclear whether this is a true decrease, or a decrease in the number of esophectomies captured in our dataset. It is possible that there were changes in procedure coding over time of which we were unaware. With the expansion of community care options for Veterans since 2014,[17,18] it is also possible a greater proportion of Veterans are receiving these procedures outside the VA. On the other hand, if this is indeed a true decline in the number of esophagectomies performed, it is possible that treatment preferences may have changed over our study period, shifting towards chemoradiation alone, or neoadjuvant chemoradiation followed by surveillance, rather than surgery.[19,20]

Another factor may relate to the increased focus on the relationship between hospital and surgeon volume, patient safety, and quality of care for high-risk, complex surgical procedures[21] such as esophagectomies.[22] The VHA's policy differs from volume recommendations/pledges (*eg*, 2015 Take the Volume Pledge[23] which required 20 esophagectomies per hospital/year and 5 espophagectomies per surgeon/year).[21] VA Directive 1220,[24] which replaced Directive 2010-18[25] in 2019, outlines VHA policy to ensure that the infrastructure of a facility is capable of supporting the surgical procedure being peformed. Each facility is given an operative complexity designation, which for inpatient procedures includes: standard (*eg*, appendectomy), intermediate (*eg*, shoulder joint reconstruction), and complex (*eg*, coronary artery bypass graft [CABG]).[26] Each surgical procedure (*ie*, CPT code) is also assigned a complexity designation, thereby determining the facilities in which an operation can be performed. All of our included CPT codes are designated as inpatient complex procedures. There are currently 110 facilities peforming inpatient surgeries in the VHA, of which 70 are designated complex (Appendix C).[27,28]

Prior to the expansion of community care, much of VHA-funded Veteran care was provided in VHA facilities. With the expansion of VA community-based care, access to VHA-funded community care increased over our study period, allowing Veterans to see private sector providers in cases where they faced long wait times, travel, lack of services available in the VA facility, or the possibility of poor quality care.[29] VA Medical Centers (VAMCs) designated as inpatient complex facilities tend to be located in densely populated regions, many of them in the Northeast or South or on the West Coast. In the Midwest, facilities are located in major metropolitan areas, with longer distances between (see Appendix C). Given that nearly 3 million Veterans served by the VHA live in rural areas,[30] this increased access to private sector surgeons, particularly in areas with less access to facilities designated for inpatient complex procedures, may have contributed to the overall decline over time.

Between 2015 and 2019, the number of robotic systems in the VHA increased from 48 to 93, with the distribution of locations closely resembling those designated as inpatient complex (see Appendix D; Jason Lamb, Director Government Accounts, Intuitive Surgical, email communication, June 2021). The increased access to robotic platforms would suggest a

consistent upward trend, as found with robot-assisted cholescystectomies, inguinal hernia repairs, and ventral hernia repairs during the same time period.[31] However, these general surgery procedures are much more common than esophagectomies, they range in complexity from ambulatory basic to inpatient standard,[27] and they are accessible to a larger percentage of Veterans served by the VHA.

The 2020 ESP's systematic review found low certainty evidence that compared to VAMIE, operative time associated with RAMIE was significantly longer, and high certainty evidence that RAMIE was longer than open esophagectomies. Our findings suggest that this is also true in VHA facilities. We found no difference in postoperative LOS by surgical approach. This is consistent with the systematic review's finding of moderate certainty evidence that LOS for RAMIE and VAMIE were similar. However, the ESP's systematic review determined that there was very low certainty evidence that postoperative LOS was shorter for Veterans undergoing RAMIE compared to open esophagectomies. Inconsistent findings contributed to the very low certainty rating.[4]

LIMITATIONS

There are several limitations to our analysis. The data were obtained retrospectively from 2 large databases that are susceptible to inexact coding and reporting error. Robot-assisted procedures were only identified if the S2900 modifier was utilized, which likely led to underestimation of cases. A 2020 VA Office of Inspector General (OIG) audit of the governance of robotic surgical systems reported that the National Surgery Office (NSO) underreported the number of robotic surgical procedures by more than 2,300 cases in 2018, largely due to the lack of policy requiring the addition of the S2900 modifier.[32] Although we don't know how many of the missing cases from 2018 are relevant to our analysis, and how many may be missing from other years, it is possible that our findings may be different. Our data were limited to VHA settings, and did not include esophagectomies performed under fee basis or under contract to community-based providers. In addition, VAMIE includes both laparoscopic and thoracoscopic procedures. However, laparoscopic procedures require a second CPT code in addition to an open esophagectomy CPT code, and there were no CPT codes for thoracoscopic esophagectomies until 2018.[33] It is possible that these procedures are underreported.[34] Finally, a large majority of Veterans included in our analysis were non-Hispanic White males. Recent studies, including a population-based study examining racial, ethnic, and socioeconomic (SES) disparities in the receipt of robot-assisted surgery across daVinci systems nationwide found that Black, Hispanic, and low SES patients were less likely to receive robot-assisted surgery.[35,36] It remains unclear whether the VHA's system of universal access, particularly since the expansion of community care, successfully mitigates these disparities.

CONCLUSION

This exploratory analysis of VHA data augments findings from the 2020 ESP systematic review, found that from 2015 to 2018 utilization of the robotic platform for esophagectomies across the VHA remained relatively stable. Over the same period, the total number of esophagectomies decreased by 58%. Our unadjusted findings that operative times were longer, and that postoperative LOS similar were consistent with the conclusions of the 2020 ESP systematic review.

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APPENDIX A. VASQIP VARIABLES

VASQIP Variables		Definition	Scoring
1 or more VASQIP complication	**SCORE1**	If the patient had surgical complications, score1=1, if no complications, score1=0	0 or 1
Myocardial infarction	**CDMI**	During surgery or 30 days post; A new transmural acute myocardial infarction occurring during surgery or within 30 days following surgery as manifested by new Q-waves on ECG. Non-Q-wave infarctions should be entered under "OTHER".	0 or 1
Bleeding req > 4 units PRBCs	**OTHBLEED**	Any transfusion (including autologous) of packed red blood cells or whole blood given from the time the patient leaves the operating room up to and including 72 hours postoperatively. Enter "YES" for five or more units of packed red blood cell units in the postoperative period including hanging blood from the OR that is finished outside of the OR. If the patient receives shed blood, autologous blood, cell saver blood or pleurovac postoperatively, this is counted if greater than four units. The blood may be given for any reason.	0 or 1
Systemic sepsis	**OTHSYSEP**	Within 30 days postop; If the primary physician or the chart states that the patient had systemic sepsis within the 30 days postoperatively, choose from the following choices for sepsis. If neither is present follow these definitions and choose the most applicable: Sepsis: Definitive evidence of infection, plus evidence of a systemic response to infection. This systemic response is manifested by 2 or more of the following conditions: Temp >38 degrees C or <36 degrees C Septic Shock: Sepsis with hypotension despite adequate fluid resuscitation combined with perfusion abnormalities that may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status. Patients who are on inotropic or vasopressor agents may not be hypotensive at the time that perfusion abnormalities are measured. -HR >90 bpm -RR >20 breaths/min or PaCO2 <32 mmHg(<4.3 kPa) -WBC >12,000 cell/mm3, <4000 cells/mm3, or >10% immature (band) forms	0 or 1

VASQIP Variables		Definition	Scoring
Pneumonia - outcome	**OUPNEUMO**	Inflammation of the lungs caused primarily by bacteria, viruses, and/or chemical irritants, usually manifested by chills, fever, pain in the chest, cough, purulent, bloody sputum. Enter "YES" if the patient has pneumonia meeting the CDC definition of pneumonia below AND pneumonia not present preoperatively. Pneumonia must meet 1 of the following 2 criteria: -Criterion 1. Rales or dullness to percussion on physical examination of chest AND any of the following: New onset of purulent sputum or change in character of sputum Organism isolate from blood culture Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy -Criterion 2. Chest radiographic examination shows new or progressive infiltrate, consolidation, cavitation, or pleural effusion AND any of the following: New onset of purulent sputum or change in character of sputum Organism isolated from the blood Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy Isolation of virus or detection of viral antigen in respiratory secretions Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen Histopathologic evidence of pneumonia	0 or 1
Pulmonary embolism	**PULEMBOL**	Lodging of a blood clot in a pulmonary artery with subsequent obstruction of blood supply to the lung parenchyma. The blood clots usually originate from the deep leg veins or the pelvic venous system. Enter "YES" if the patient has a V-Q scan interpreted as high probability of pulmonary embolism or a positive pulmonary arteriogram or positive CT scan. Treatment usually consists of: -Initiation of anticoagulation therapy -Placement of mechanical interruption (*eg*, Greenfield Filter), for patients in whom anticoagulation is contraindicated or already instituted.	0 or 1
Acute renal failure (post-op)	**OPRENAFL**	In a patient who did not require dialysis preoperatively, worsening of renal dysfunction postoperatively requiring hemodialysis, ultrafiltration, or peritoneal dialysis. TIP: If the patient refuses dialysis the answer is Yes to this variable, because he/she did require dialysis.	0 or 1

VASQIP Variables		Definition	Scoring
Superficial surgical site infection	**SUPINFEC**	Use the following Centers for Disease Control (CDC) definition: Superficial incisional SSI is an infection that occurs within 30 days after the operation and infection involves only skin or subcutaneous tissue of the incision and at least 1 of the following: -Purulent drainage, with or without laboratory confirmation, from the superficial incision. -Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision. -At least 1 of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat and superficial incision is deliberately opened by the surgeon, unless incision is culture-negative. -Diagnosis of superficial incisional SSI by the surgeon or attending physician. Excludes the following conditions as SSI: -Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration). -Infected burn wound. -Incisional SSI that extends into the fascial and muscle layers (see deep incisional SSI).	0 or 1
Death within 30 days in PIMS	**POSTCODE**	Death within 30 days (oprymd - dtdeath)	0 or 1
Preoperative hospital stay	**PRHLOS**	Length of preoperative hospital stay (in days)	# days
Postoperative hospital stay	**POHOLOS**	Length of postoperative hospital stay (in days)	# days
Operative Time	**OPTIME**	Total operation time in hours	hours. minutes

APPENDIX B. ONE OR MORE VASQIP COMPLICATION: LIST OF COMPLICATIONS

Label		VASQIP Definition	Scoring
Return to OR within 30 days	**RETURNOR**	Returns to the operating room include all surgical procedures that required the patient to be taken to the surgical operating room for intervention of any kind within 30 days of the procedure will automatically be entered by the software.	0 or 1
Cardiac arrest requiring CPR	**CDARREST**	The absence of cardiac rhythm or presence of chaotic cardiac rhythm that results in loss of consciousness requiring the initiation of any component of basic and/or advanced cardiac life support.	0 or 1
Myocardial infarction	**CDMI**	A new transmural acute myocardial infarction occurring during surgery or within 30 days following surgery as manifested by new Q-waves on ECG. Non-Q-wave infarctions should be entered under "OTHER".	0 or 1
Coma lasting > 24 hours post-op	**CNSCOMA**	This is defined as significantly impaired level of consciousness (exclude transient disorientation or psychosis) for greater than 24 hours during the postoperative hospitalization.	0 or 1
Cerebral vascular accident (CVA)/Stroke	**CNSCVA**	Patient develops an embolic, thrombotic, or hemorrhagic vascular accident or stroke with motor, sensory, or cognitive dysfunction (*eg*, hemiplegia, hemiparesis, aphasia, sensory deficit, impaired memory) that persist for 24 or more hours.	0 or 1
Peripheral nerve injury	**NEURODEF**	Peripheral nerve damage may result from damage to the nerve fibers, cell body, or myelin sheath during surgery. Peripheral nerve injuries (*eg*, motor, sensory, and mixed motor/sensory injury) to the cervical plexus, brachial plexus, ulnar plexus, lumbar-sacral plexus (sciatic nerve), perineal nerve, and/or the femoral nerve should be included.	0 or 1
Clostridium difficile colitis	**CDIFCOLITIS**	C. difficile-associated disease occurs when the normal intestinal flora is altered, allowing C. difficile to flourish in the intestinal tract and produce a toxin that causes a watery diarrhea. C. difficile diarrhea is confirmed by the presence of a toxin in a stool specimen. Answer yes only if you have a positive culture for C. difficile with a toxin assay and/or diagnosis of C. difficile documented in the chart.	0 or 1
Bleeding req > 4 units PRBCs	**OTHBLEED**	Any transfusion (including autologous) of packed red blood cells or whole blood given from the time the patient leaves the operating room up to and including 72 hours postoperatively. Enter "YES" for five or more units of packed red blood cell units in the postoperative period including hanging blood from the OR that is finished outside of the OR. If the patient receives shed blood, autologous blood, cell saver blood or pleurovac postoperatively, this is	0 or 1

Label		VASQIP Definition	Scoring
		counted if greater than four units. The blood may be given for any reason.	
Deep vein thrombosis (DVT)/ Thrombophlebitis	**OTHDVT**	The identification of a new blood clot or thrombus within the venous system, which may be coupled with inflammation. This diagnosis is confirmed by a duplex, venogram or CT scan. The patient must be treated with anticoagulation therapy, and/or placement of a vena cava filter or clipping of the vena cava.	0 or 1
Graft/prosthesis failure	**OTHGRAFL**	Mechanical failure of an extracardiac vascular graft or prosthesis including myocutaneous flaps and skin grafts requiring return to the operating room or a balloon angioplasty.	0 or 1
Prolonged ileus	**OTHOBSTR**	Ileus is obstruction of the intestines from a variety of causes including mechanical obstruction, peritonitis, adhesions, or post-surgically as a result of functional dysmotility by the bowel. Bowel obstruction is any hindrance to the passage of the intestinal contents. Prolonged ileus or obstruction is defined as longer than 5 days postoperatively.	0 or 1
Systemic sepsis	**OTHSYSEP**	If the primary physician or the chart states that the patient had systemic sepsis within the 30 days postoperatively, choose from the following choices for sepsis. If neither is present follow these definitions and choose the most applicable: (1) Sepsis: Definitive evidence of infection, plus evidence of a systemic response to infection. This systemic response is manifested by 2 or more of the following conditions: Temp >38 degrees C or <36 degrees C (2) Septic Shock: Sepsis with hypotension despite adequate fluid resuscitation combined with perfusion abnormalities that may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status. Patients who are on inotropic or vasopressor agents may not be hypotensive at the time that perfusion abnormalities are measured. - HR >90 bpm - RR >20 breaths/min or PaCO2 <32 mmHg (<4.3 kPa) WBC >12,000 cell/mm3, <4000 cells/mm3, or >10% immature (band) forms	0 or 1
Failure to wean > 48 hours	**FAILWEAN**	On ventilator >48 hours postoperative	0 or 1
Pneumonia	**OUPNEUMO**	Inflammation of the lungs caused primarily by bacteria, viruses, and/or chemical irritants, usually manifested by chills, fever, pain in the chest, cough, purulent, bloody sputum. Enter "YES" if the patient has pneumonia meeting the CDC definition of pneumonia below AND pneumonia not present	0 or 1

Label		VASQIP Definition	Scoring
		preoperatively. Pneumonia must meet 1 of the following 2 criteria: -Criterion 1. Rales or dullness to percussion on physical examination of chest AND any of the following: a. New onset of purulent sputum or change in character of sputum b. Organism isolate from blood culture c. Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy OR -Criterion 2. Chest radiographic examination shows new or progressive infiltrate, consolidation, cavitation, or pleural effusion AND any of the following: a. New onset of purulent sputum or change in character of sputum b. Organism isolated from the blood c. Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy d. Isolation of virus or detection of viral antigen in respiratory secretions e. Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen f. Histopathologic evidence of pneumonia	
Pulmonary embolism	**PULEMBOL**	Lodging of a blood clot in a pulmonary artery with subsequent obstruction of blood supply to the lung parenchyma. The blood clots usually originate from the deep leg veins or the pelvic venous system. Enter "YES" if the patient has a V-Q scan interpreted as high probability of pulmonary embolism or a positive pulmonary arteriogram or positive CT scan. Treatment usually consists of: -Initiation of anticoagulation therapy -Placement of mechanical interruption (*eg*, Greenfield Filter), for patients in whom anticoagulation is contraindicated or already instituted.	0 or 1
Reintubation for respiratory/ cardiac failure	**REINTUB**	Patient required placement of an endotracheal tube and mechanical or assisted ventilation because of the onset of respiratory or cardiac failure manifested by severe respiratory distress, hypoxia, hypercarbia, or respiratory acidosis. In patients who were intubated for their surgery, unplanned intubation occurs after they have been extubated after surgery. In patients who were not intubated during surgery, intubation at any time after their surgery is considered unplanned.	0 or 1
Acute renal failure	**OPRENAFL**	In a patient who did not require dialysis preoperatively, worsening of renal dysfunction postoperatively requiring hemodialysis, ultrafiltration, or peritoneal dialysis.	0 or 1

Label		VASQIP Definition	Scoring
Progressive renal insufficiency	**RENAINSF**	The reduced capacity of the kidney to perform its function as evidenced by a rise in creatinine of >2 mg/dl from preoperative value, but with no requirement for dialysis.	0 or 1
Urinary tract infection	**URNINFEC**	Postoperative symptomatic urinary tract infection must meet 1 of the following 2 criteria from the CDC definition: 1. One of the following: fever (>38 degrees C), urgency, frequency, dysuria, or suprapubic tenderness AND a urine culture of > 105 colonies/ml urine with no more than 2 species of organisms OR 2. Two of the following: fever (>38 degrees C), urgency, frequency, dysuria, or suprapubic tenderness AND any of the following: -Dipstick test positive for leukocyte esterase and/or nitrate -Pyuria (>10 WBCs/cc or > 3 WBC/hpf of unspun urine) -Organisms seen on Gram stain of unspun urine -Two urine cultures with repeated isolation of the same uropathogen with >102 colonies/ml urine in non-voided specimen -Urine culture with < 105 colonies/ml urine of single uropathogen in patient being treated with appropriate antimicrobial therapy -Physician's diagnosis -Physician institutes appropriate antimicrobial therapy	0 or 1
Wound disruption/ dehiscence	**DEHIS**	Separation of the layers of a surgical wound, which may be partial or complete, with disruption of the fascia.	0 or 1
Organ/Space SSI	**ORGSPCSSI**	An infection that occurs within 30 days after the operation and the infection appears to be related to the operation and the infection involves any part of the anatomy (*eg*, organs or spaces), other than the incision, which was opened or manipulated during and operation and at least 1 of the following: -Purulent drainage from a drain that is placed through a stab wound into the organ/space -Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space -An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination -Diagnosis of an organ/space SSI by a surgeon or attending physician	0 or 1

Label		VASQIP Definition	Scoring
Superficial surgical site infection	**SUPINFEC**	Use the following CDC definition: Deep Incision SSI is an infection that occurs within 30 days after the operation and the infection appears to be related to the operation and infection involved deep soft tissues (*eg*, fascial and muscle layers) of the incision and at least 1 of the following: -Purulent drainage from the deep incision but not from the organ/space component of the surgical site. -A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least 1 of the following signs or symptoms: fever (> 38 C), localized pain, or tenderness, unless site is culture-negative. -An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination. -Diagnosis of a deep incision SSI by a surgeon or attending physician.	0 or 1
Deep wound surgical site infection	**WNDINFD**	Use the following CDC definition: Deep Incision SSI is an infection that occurs within 30 days after the operation and the infection appears to be related to the operation and infection involved deep soft tissues (*eg*, fascial and muscle layers) of the incision and at least 1 of the following: -Purulent drainage from the deep incision but not from the organ/space component of the surgical site. -A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least 1 of the following signs or symptoms: fever (> 38 C), localized pain, or tenderness, unless site is culture-negative. -An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination. -Diagnosis of a deep incision SSI by a surgeon or attending physician.	0 or 1

Note. The variable “1 or more VASQIP complications” is scored as a 0 or 1. If any of the above complications has a score of 1, the score for "1 or more VASQIP complications" will also have a 1.

APPENDIX C. INVASIVE PROCEDURE COMPLEXITY

110 Inpatient VA Hospitals			
VA Inpatient Medical Center	**Facility Number**	**VISN**	**Invasive Procedure Complexity Designation**
Togus, ME	402	1	Intermediate
White River Junction, VT	405	1	Intermediate
West Roxbury, MA	523A4	1	Complex
Providence, RI	650	1	Intermediate
West Haven, CT	689	1	Complex
Bronx, NY	526	2	Complex
Buffalo, NY	528	2	Complex
Syracuse, NY	528A7	2	Complex
Albany, NY	528A8	2	Complex
East Orange, NJ	561	2	Complex
New York, NY	630	2	Complex
Brooklyn, NY	630A4	2	Complex
Northport, NY	632	2	Complex
Wilmington, DE	460	4	Intermediate
Lebanon, PA	595	4	Intermediate
Philadelphia, PA	642	4	Complex
Pittsburgh, PA	646	4	Complex
Wilkes-Barre, PA	693	4	Intermediate
Baltimore, MD	512	5	Complex
Beckley, WV	517	5	Standard
Clarksburg, WV	540	5	Intermediate
Huntington, WV	581	5	Complex
Martinsburg, WV	613	5	Intermediate
Washington, DC	688	5	Complex
Durham, NC	558	6	Complex
Fayetteville, NC	565	6	Standard
Hampton, VA	590	6	Intermediate
Asheville, NC	637	6	Complex
Richmond, VA	652	6	Complex
Salem, VA	658	6	Intermediate
Salisbury, NC	659	6	Intermediate
Atlanta, GA	508	7	Complex
Augusta, GA	509	7	Complex
Birmingham, AL	521	7	Complex
Charleston, SC	534	7	Complex

Columbia, SC	544	7	Complex
Dublin, GA	557	7	Standard
Montgomery, AL	619	7	Standard
Bay Pines, FL	516	8	Complex
Miami, FL	546	8	Complex
West Palm Beach, FL	548	8	Intermediate
Gainesville, FL	573	8	Complex
San Juan, PR	672	8	Complex
Tampa, FL	673	8	Complex
Orlando, FL	675	8	Intermediate
Lexington, KY	596A4	9	Complex
Louisville, KY	603	9	Complex
Memphis, TN	614	9	Complex
Mountain Home, TN	621	9	Intermediate
Nashville, TN	626	9	Complex
Ann Arbor, MI	506	10	Complex
Cincinnati, OH	539	10	Complex
Cleveland, OH	541	10	Complex
Dayton, OH	552	10	Intermediate
Detroit, MI	553	10	Complex
Indianapolis, IN	583	10	Complex
Fort Wayne, IN	610A4	10	Standard
Chicago-Jesse Brown, IL	537	12	Complex
North Chicago, IL	556	12	Intermediate
Hines, IL	578	12	Complex
Madison, WI	607	12	Complex
Milwaukee, WI	695	12	Complex
Kansas City, MO	589	15	Complex
Columbia, MO	589A4	15	Complex
Leavenworth, KS	589A6	15	Standard
Wichita, KS	589A7	15	Intermediate
St. Louis, MO	657	15	Complex
Marion, IL	657A5	15	Standard
Biloxi, MS	520	16	Intermediate
Fayetteville, AR	564	16	Intermediate
Houston, TX	580	16	Complex
Jackson, MS	586	16	Complex
Little Rock, AR	598	16	Complex
New Orleans, LA	629	16	Complex
Shreveport, LA	667	16	Complex

Amarillo, TX	504	17	Intermediate
Dallas, TX	549	17	Complex
San Antonio, TX	671	17	Complex
Temple, TX	674	17	Complex
Fort Harrison, MT	436	19	Standard
Cheyenne, WY	442	19	Standard
Denver, CO	554	19	Complex
Grand Junction, CO	575	19	Standard
Muskogee, OK	623	19	Intermediate
Oklahoma City, OK	635	19	Complex
Salt Lake City, UT	660	19	Complex
Boise, ID	531	20	Intermediate
Portland, OR	648	20	Complex
Seattle, WA	663	20	Complex
Spokane, WA	668	20	Standard
Fresno, CA	570	21	Intermediate
Las Vegas, NV	593	21	Intermediate
Sacramento, CA	612A4	21	Complex
Palo Alto, CA	640	21	Complex
Reno, NV	654	21	Intermediate
San Francisco, CA	662	21	Complex
Albuquerque, NM	501	22	Complex
Long Beach, CA	600	22	Complex
Loma Linda, CA	605	22	Complex
Phoenix, AZ	644	22	Complex
San Diego, CA	664	22	Complex
Tucson, AZ	678	22	Complex
West Los Angeles, CA	691	22	Complex
Fargo, ND	437	23	Intermediate
Sioux Falls, SD	438	23	Intermediate
Fort Meade, SD	568	23	Standard
Minneapolis, MN	618	23	Complex
Omaha, NE	636	23	Complex
Des Moines, IA	636A6	23	Intermediate
Iowa City, IA	636A8	23	Complex

Notes. Table was original posted on the page “Invasive Procedure Complexity” by VHA National Surgery Office.[27]

APPENDIX D. ROBOTIC SYSTEMS BY VHA FACILITY AND YEAR

Facility		2015	2017	2019
VISN 1				
VA Boston Healthcare System, West Roxbury Division		1	1	1
VA Connecticut Healthcare System West Haven Campus		1	1	1
	Total	*2*	*2*	*2*
VISN 2				
Albany VA Medical Center: Samuel S. Stratton		1	1	1
East Orange Campus of the VA New Jersey Health Care System		1	1	1
James J. Peters VA Medical Center (Bronx, NY)		1	1	2
Manhattan Campus of VA NY Harbor Healthcare System		1	1	2
Syracuse VA Medical Center		1	1	3
VA Western New York Healthcare System at Buffalo		1	1	1
	Total	*6*	*6*	*10*
VISN 4				
Philadelphia VA Medical Center		1	1	2
VA Pittsburgh Healthcare System, University Drive Campus		1	2	2
	Total	*2*	*3*	*4*
VISN 5				
Washington DC VA Medical Center		1	1	2
	Total	*1*	*1*	*2*
VISN 6				
Durham VA Medical Center		1	1	1
Hampton VA Medical Center		0	0	1
Hunter Holmes McGuire VA Medical Center		1	1	2
Salisbury - W.G. (Bill) Hefner VA Medical Center		1	2	3
	Total	*3*	*4*	*7*
VISN 7				
Birmingham VA Medical Center		1	1	2
Ralph H. Johnson VA Medical Center		1	1	2
VA Medical Center - Augusta		1	1	2
William Jennings Bryan Dorn VA Medical Center		0	0	1
	Total	*3*	*3*	*7*
VISN 8				
James A. Haley Veterans' Hospital		0	1	2
Malcom Randall VA Medical Center		0	1	1
Miami VA Medical Center		1	1	1
VAMC Lake Nona		0	0	1
	Total	*1*	*3*	*5*
VISN 9				

Facility		2015	2017	2019
Lexington VA Medical Center		1	1	1
Mountain Home VAMC-Johnson City		0	0	1
Robley Rex VA Medical Center		0	0	2
Tennessee Valley Healthcare System - Nashville Campus		0	0	1
	Total	*1*	*1*	*5*
VISN 10				
Cincinnati VA Medical Center		1	1	1
John D. Dingell VA Medical Center		1	1	2
Louis Stokes Cleveland Dept Veteran Affairs Medical Center		1	1	1
Richard L. Roudebush VA Medical Center		1	1	2
VA Ann Arbor Healthcare System		1	1	1
	Total	*5*	*5*	*7*
VISN 12				
Clement J. Zablocki Veterans Affairs Medical Center		1	1	2
Edward Hines Jr. VA Hospital		1	2	1
Jesse Brown VA Medical Center		1	1	2
William S. Middleton Memorial Veterans Hospital		1	1	1
	Total	*4*	*5*	*6*
VISN 15				
VA St. Louis Health Care System - Jefferson Barracks Division		1	1	2
	Total	*1*	*1*	*2*
VISN 16				
G.V. (Sonny) Montgomery VA Medical Center		0	0	1
John L. McClellan Memorial Veterans Hospital		0	0	1
Michael E. Debakey VA Medical Center		2	3	3
Oklahoma City VA Medical Center		0	1	1
Southeast Louisiana Veterans Health Care System		0	2	2
	Total	*2*	*6*	*8*
VISN 17				
Central Texas Veterans Health Care System		0	0	1
South Texas Veterans Health Care System		1	1	2
VA North Texas Health Care System: Dallas VA Medical Center		3	2	2
	Total	*4*	*3*	*5*
VISN 18				
New Mexico VA Health Care System		1	1	1
Phoenix VA Health Care System		0	1	2
Southern Arizona VA Healthcare System		1	1	2
	Total	*2*	*3*	*5*
VISN 19				
Rocky Mountain Regional VA Medical Center		0	0	1
VA Eastern Colorado Health Care System		1	2	0

Facility		**2015**	**2017**	**2019**
VA Salt Lake City Health Care System		1	1	1
	Total	*2*	*3*	*2*
VISN 20				
Portland VA Health Care System		0	1	1
VA Puget Sound Health Care System - Seattle Division		1	1	1
	Total	*1*	*2*	*2*
VISN 21				
San Francisco VA Medical Center		1	1	2
VA Northern California Health Care System		1	1	1
VA Palo Alto Healthcare System		2	1	1
VA Southern Nevada Healthcare System (VASNHS)		0	1	1
	Total	*4*	*4*	*5*
VISN 22				
VA Greater Los Angeles Health Care System		1	1	1
VA Loma Linda Healthcare System		1	2	2
VA Long Beach Healthcare System		0	1	1
VA San Diego Healthcare System		1	2	3
	Total	*3*	*6*	*7*
VISN 23				
Minneapolis VA Health Care System		1	1	1
Omaha VA Medical Center		0	1	1
	Total	*1*	*2*	*2*
	VISN Total	*48*	*63*	*93*