



# MAHSO

MARKET AREA HEALTH SYSTEMS OPTIMIZATION

## National Planning Strategy

Surgery

March 2021



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## Executive Summary

The Department of Veterans Affairs (VA) Market Area Health Systems Optimization (MAHSO) effort developed 96 draft market assessments in the 18 VA Veteran Integrated Service Networks (VISNs) to produce opportunities for the design of high-performing integrated delivery networks. These market assessments were required by the VA Maintaining Systems and Strengthening Integrated Outside Networks (MISSION) Act of 2018.

These market assessments will culminate with a National Realignment Strategy that will present Veterans Health Administration's (VHA's) plan for the future of VA health care, enabling Veterans to access the right high-quality care in the right location. Recommendations from the market assessments will be finalized and submitted by the Secretary of VA to the presidentially appointed Asset and Infrastructure Review (AIR) Commission for consideration. The AIR Commission will submit its recommendations to the President for review and approval, prior to them sending to Congress for review and approval.

This Surgery National Planning Strategy establishes a consistent set of guidelines that will help to develop the opportunities that are specific to surgical services. Using comprehensive VA data, the guidelines can facilitate improved alignment of surgical capacity and capabilities with the evolving needs of Veterans.

The VHA Chief Strategy Office (CSO), committed to working with offices across the organization to create programs and services that best serve Veterans, developed the Surgery National Planning Strategy in consultation with the National Surgery Office (NSO).

### **Surgery Program Overview**

The alignment of surgical infrastructure with current and future demand and addressing the high variance in surgical asset utilization are two key challenges for VA to solve. Rapidly evolving technology has universally changed surgical service delivery, enabling more outpatient capabilities, decreasing frequency and length of inpatient surgical admissions, and requiring more sophisticated built environments such as operating rooms (ORs), specialty procedure areas, and equipment. VA-specific changes, such as shifting Veteran population centers, surgical demand trends, evolving Veteran expectations, and requirements brought about by The MISSION Act, represent further planning drivers for the surgical programs across VA markets and service networks.

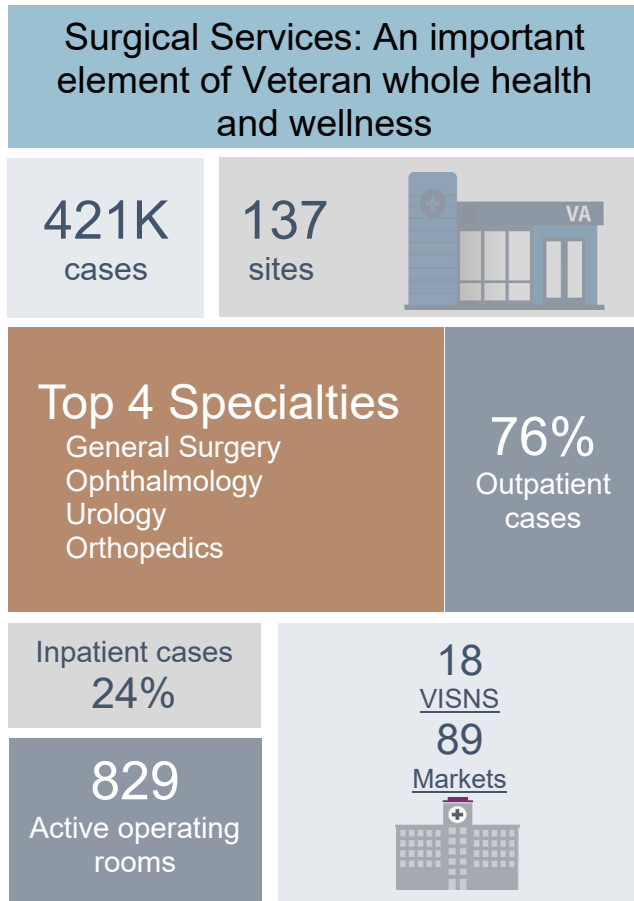
There are 137 sites that currently offer surgery across the United States and in Puerto Rico, 109 of which offer inpatient surgery. Fiscal Year (FY) 2019 case volume per site among all facility types ranged from 11 cases to 9,611 (median 2,918).<sup>1,2</sup>



In FY 2019, over 421,000 cases were performed at VA facilities. The top four VA in-house surgical specialties by case volume in FY 2019 were General Surgery, Ophthalmology, Urology, and Orthopedic Surgery. These top specialties comprised 68.2% of total in-house surgical caseload. These four specialties were also the busiest providers of outpatient surgery. Outpatient surgical cases in VA accounted for over 76.0% of total case volume. <sup>1</sup>

While provided and purchased inpatient and outpatient surgery volumes are modestly increasing, more growth is seen in the utilization of community care providers.

Data review and site visits to VAMC’s reveal often antiquated ORs, and ORs not in use due to low demand or staffing challenges. This is consistent with aging structures built at a time of much higher inpatient surgical demand. In FY 2019, there were 860 equipped operating rooms (ORs), 829 of which were active (staffed). <sup>3</sup>



### Resulting Planning Guidelines and Thresholds

Planning guidelines and thresholds inform products of the market assessment process. The rationale for establishing VA planning guidelines and thresholds are rooted in the belief that quality of care or patient safety may be compromised when a service falls below identified measures.

Specifically, planning priorities for Surgery include:

- Defining a minimum viable surgical program, based on case volumes;
- Aligning surgical resources (operating rooms) to current case volume and future in-house demand; and
- Developing planning guidelines for sizing future surgical suites, based on enrollee populations likely to utilize surgical services at VA.



### Surgery Planning Guidelines (Supply and Demand only)

Service	Primary Planning Guidelines
Inpatient Surgery	<p><b>Open</b> new surgical program at a VAMC:</p> <ul style="list-style-type: none"> <li>○ Minimum 31,400 (10-year) projected enrollees in the market to establish two general ORs at 800 cases per OR per year, and</li> <li>○ At least 1.4 surgeon FTE per specialty can be consistently staffed</li> </ul> <p><b>Build</b> additional ORs:</p> <ul style="list-style-type: none"> <li>○ ORs are all operating at or above 800 cases/OR annually, and</li> <li>○ At least 1.4 surgeon FTE per each new specialty can be consistently staffed</li> </ul> <p><b>Maintain</b> combined inpatient/outpatient program:</p> <ul style="list-style-type: none"> <li>○ Greater than 1,600 surgical cases per year at the existing facility, and</li> <li>○ At least 1.4 surgeon FTE per specialty can be consistently staffed</li> </ul> <p><b>Partner:</b></p> <ul style="list-style-type: none"> <li>○ Urban Market: Fewer than 1,600 total surgical cases annually.</li> <li>○ Rural Market: Fewer than 1,600 surgical cases <u>and</u> procedures annually.</li> </ul>
Outpatient Surgery	<p><b>Open</b> a new ambulatory surgery program:</p> <ul style="list-style-type: none"> <li>○ Minimum 34,720 non-overlapping FY 2019 enrollees within 60 minutes of the proposed site to establish two general ORs at 1,000 cases per OR, and</li> <li>○ At least 1.4 surgeon FTE per specialty can be consistently staffed</li> </ul> <p><b>Build</b> additional ORs:</p> <ul style="list-style-type: none"> <li>○ ORs are all operating at or above 1,000 cases/OR annually, and</li> <li>○ At least 1.4 surgeon FTE per each new specialty can be consistently staffed</li> </ul> <p><b>Maintain</b> outpatient program:</p> <ul style="list-style-type: none"> <li>○ Greater than 2,000 surgical cases per year at the existing facility</li> <li>○ At least 1.4 surgeon FTE per specialty can be consistently staffed</li> </ul> <p><b>Partner:</b></p> <ul style="list-style-type: none"> <li>○ Urban Market: Fewer than 2,000 total surgical cases annually.</li> <li>○ Rural Market: Fewer than 2,000 surgical cases <u>and</u> procedures annually</li> </ul>

### Future Program Planning

The four-step process for revisiting MAHSO draft opportunities describes how Surgery-specific market assessment opportunities will be reviewed and updated, if necessary:

1. Review existing Phase 1-3 market assessment data and surgical opportunities
2. Apply Surgery planning guidelines
3. Update/Create Surgery opportunities
4. Review and finalize opportunities with VA Leadership



VA will use the national planning guidelines to apply standard programmatic criteria to major strategic opportunities identified in the market assessments. The planning guidelines will also inform future quadrennial market assessments and other long-range planning exercises.

The Surgery guidelines and thresholds will be used to ensure that capital planning is matched to Veteran demand and a sound, consistent set of recommendations is established to inform the development of the National Realignment Strategy. The planning guidelines will also inform future quadrennial market assessments and other long-range planning exercises.



## 1. Program Overview

Surgical care, an important part of treating the whole health of the Veteran, is delivered by the Department of Veterans Affairs (VA) at most VA Medical Centers (VAMCs) and Health Care Centers and is also purchased through the Community Care Network (CCN). The National Surgery Office (NSO) is tasked with monitoring and managing surgical quality and outcomes across VHA programs. Less defined are the responsibilities for oversight of surgical care for eligible Veterans for care performed in non-VA settings by non-VA providers. Surgical program planning, development, and operations are currently the domain of local and regional executive leadership, often in concert with academic affiliates. Hence, across VA there is significant variability as to which surgical services a market or a VAMC provides, the portion delivered by non-VA partners, the setting for surgical care delivery (inpatient or outpatient, hospital or ambulatory care center), and how many operating rooms (ORs) have been built and staffed. The national planning strategy for surgery aims to produce a comprehensive, data-driven strategy for planning operating room capacity and capability to create the high performing integrated delivery network that VA envisions.

Rapidly evolving technology has universally changed surgical service delivery, enabling more outpatient capabilities, but in the process has required more sophisticated built environments, such as ORs, specialty procedure areas, and equipment. VA-specific challenges, such as shifting population centers, surgical demand trends, and evolving Veteran expectations, in addition to the requirements brought about by The MISSION Act, all point to the need for a national planning strategy for surgery. Planning guidelines will inform which surgical specialty services VA provides, where VA provides surgery, and how much surgical infrastructure should be built and operated to support actual demand.

### 1.1 Program Mission

The mission of the VHA NSO is to establish surgical policy and provide operational oversight of clinical and quality improvement activities; to support, promote, and ensure the delivery of high quality, efficient, and Veteran-centric surgical care and services; and to provide subject matter expertise to VA leadership, the Veterans Integrated Service Networks (VISNs), VAMCs, and the surgical community.<sup>4</sup> The NSO also supports the educational and research missions of VA as related to surgical services.

Surgery has been a critical component of care delivery at VA for more than 100 years and has had an important role for the teaching and research mission since the 1940s.<sup>5 6</sup> Facilities were built to meet this mission at a time when inpatient surgical stays were longer and more frequent. In 2019, there were 136 facilities across the VHA system with a surgical program. Of the 136 facilities, 109 offered inpatient and ambulatory surgical services and the remaining 27 offered ambulatory surgical services only.<sup>2</sup> VA's current surgical mission covers a wide variety of specialties, from low complexity, higher volume services like intraocular lens implantation, to high complexity, low volume services like



organ transplant. While surgical quality is measured and monitored through the NSO, there has yet to be a mandate for a centralized planning methodology, coordinated with capital resource allocation, and aligned to clinical considerations and needs. This has, over time, led to variances in program size and scope, access, and staffing.

VA data has shown demand for inpatient surgical services and length of stay at VA has decreased and has also demonstrated a steady increase in CCN utilization. Influences on these shifts in surgical care delivery are, and will continue to be, effects of The MISSION Act, but also include factors such as Veteran migration away from historical centers of population density, an aging and increasingly female enrollee base, and the marked increase in surgical care delivered in the outpatient setting. These shifts have left VA with alignment challenges between existing surgical infrastructure and actual surgical demand. No clear guidelines exist yet for meeting demand signals with the rightsized infrastructure response across this wide and diverse network.

As science and research continue to develop and create new surgical techniques, and more care shifts from the inpatient to the outpatient setting, outdated facilities that are aged and costly to maintain will not be sustainable if Veteran satisfaction and expectations around quality and convenience are to be met. Thus, planning for surgical demand that is more appropriately addressed in rightsized, more contemporary settings is needed to both reduce ongoing operating costs and improve the patient experience by increasing both quality and access.

Although VHA surgical directives have been a guide for providing safe and effective surgical services within VA, to better utilize VA resources and focus VA's modernization efforts, a coordinated national planning strategy for surgery is needed to better align market resources with current and future market demand.





## 2. Current State Overview

Today, VA offers the full spectrum of surgical services. Nearly 70.0% of VA's surgical case volume falls into four surgical specialties, and more than 75.0% of all VA cases are performed in an outpatient setting. Increasingly, inpatient surgical admissions are being reserved for Veterans with co-morbidities that either preclude surgery in outpatient/ambulatory settings or require additional non-surgical inpatient care. Historical data and projections indicate that VA will see a continued shift in surgical care delivery from the inpatient setting to ambulatory environments, both within (outpatient) and apart from an attached hospital (ambulatory surgery centers). Additionally, there has been a steady increase in overall Veteran enrollee utilization for both inpatient and outpatient surgical services at community providers. These trends will have implications on VA's future facility needs. Much of VA's current surgical infrastructure is located in facilities with an excess of acute care beds, designed and built at a time when the majority of surgery occurred in an inpatient hospital setting. Today however, these facilities primarily operate with a much smaller acute care focus and have made accommodations to adapt to a much larger sub-acute and outpatient care focus. These facilities are typically 60 or more years old, are often not built to contemporary health care standards, and are increasingly expensive to maintain and modernize.

As a result of this evolution in surgical care delivery, across the VHA system there is notable variability among surgical programs in terms of facility utilization, demand for services, and operational efficiency. Even when normalized for complexity designation, measures such as total caseload, cases per OR, and total number of ORs, there remains a wide variance in surgical programs at VA. Understanding the factors behind these variances will be necessary in order to develop a pragmatic and effective strategy to optimize the delivery of surgical services at VA. Together with the ongoing shift in how contemporary surgical care is delivered, there is a clear need for an overarching strategy encompassing planning thresholds that ensure VA can deliver quality surgical care in an infrastructure that is rightsized and designed for modern surgical practice.

### 2.1 Demographic and Programmatic Distribution Analysis

#### **Programmatic Overview**

As the largest integrated health care delivery system in the United States, VA's mission is to provide high quality, accessible, and Veteran-centered health care services. Surgery is a critical component in fulfilling that mission, and surgical programs seek to provide high-quality surgical care for Veterans, utilize the latest research and state-of-the-art equipment to advance surgical techniques and evidence-based practice, and train surgical residents. VA surgical programs have a unique, and often highly collaborative, relationship with their academic affiliates to jointly staff and operate programs.

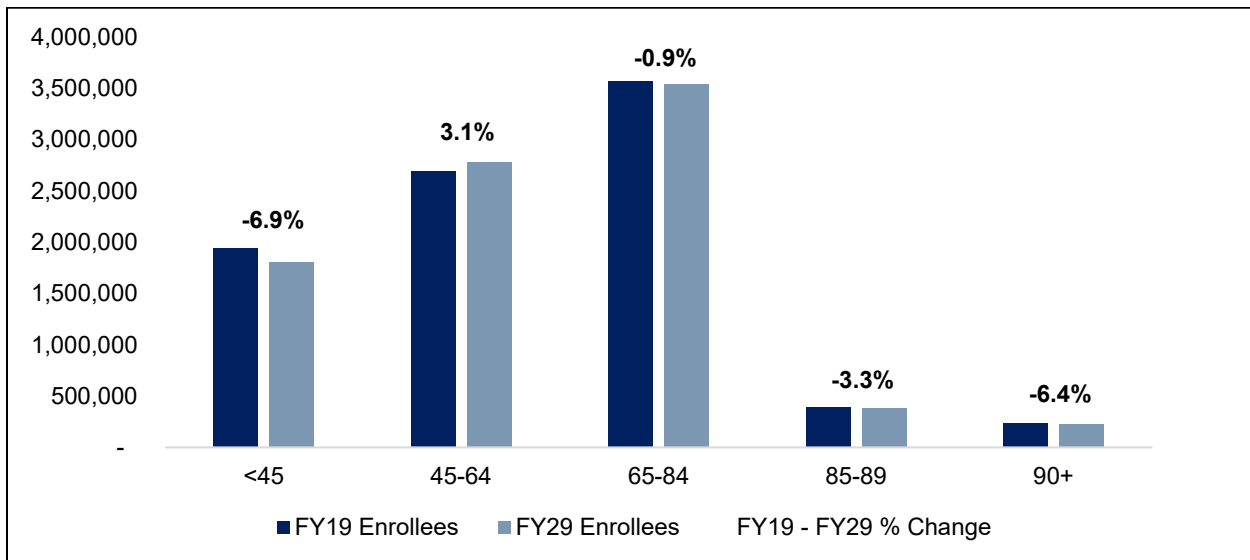


The scope of surgical services offered at VA ranges from simple outpatient procedures to advanced minimally invasive surgery and highly complex cases such as solid organ transplantation. Service offerings range by market and by facility. While some markets have multiple facilities that offer an array of surgical services, other markets and facilities offer the most basic, or no surgical services at all. When presented with the option, Veterans are increasingly electing to choose surgical care in the community to meet their needs. <sup>7</sup>

### Demographics

In FY 2019, there were 13.7 million Veterans that were eligible to receive health care services at VA, of which 8.8 million (64.4%) were enrolled with VA. <sup>8</sup> Of those 8.8 million enrolled across the 96 markets, approximately 6.0 million (68.2%) were identified as core uniques, which are Veterans who are recognized as VA’s primary users of health care services. <sup>8</sup> Overall, the number of Veteran enrollees is projected to decrease slightly by 1.3% between FY 2019 and FY 2029, from 8.8 million to 8.7 million enrollees. Within this slight decrease, there is projected to be an overall shift in demographics within the enrollee population. As shown in Figure 1, the under 45 and over 90 age groups are projected to experience the largest decrease by FY 2029, decreasing 6.9% and 6.4%, respectively. The only age group with a projected increase by FY 2029 is Veteran enrollees aged 45-64 at 3.1%. However, the 65-84 age group is projected to remain as the largest cohort with more than 3.5 million enrollees.

Figure 1: FY 2019-29 Enrollees by Age Group (Years)



Source: Department of Veterans Affairs EHCPM 2020

There is also projected to be a large shift in enrollee priority by FY 2029. Table 1 shows this shift, in which a large decrease is anticipated in priority groups 2 through 8, while priority group 1 is projected to increase by 48.4%. This shift in priority may be relevant



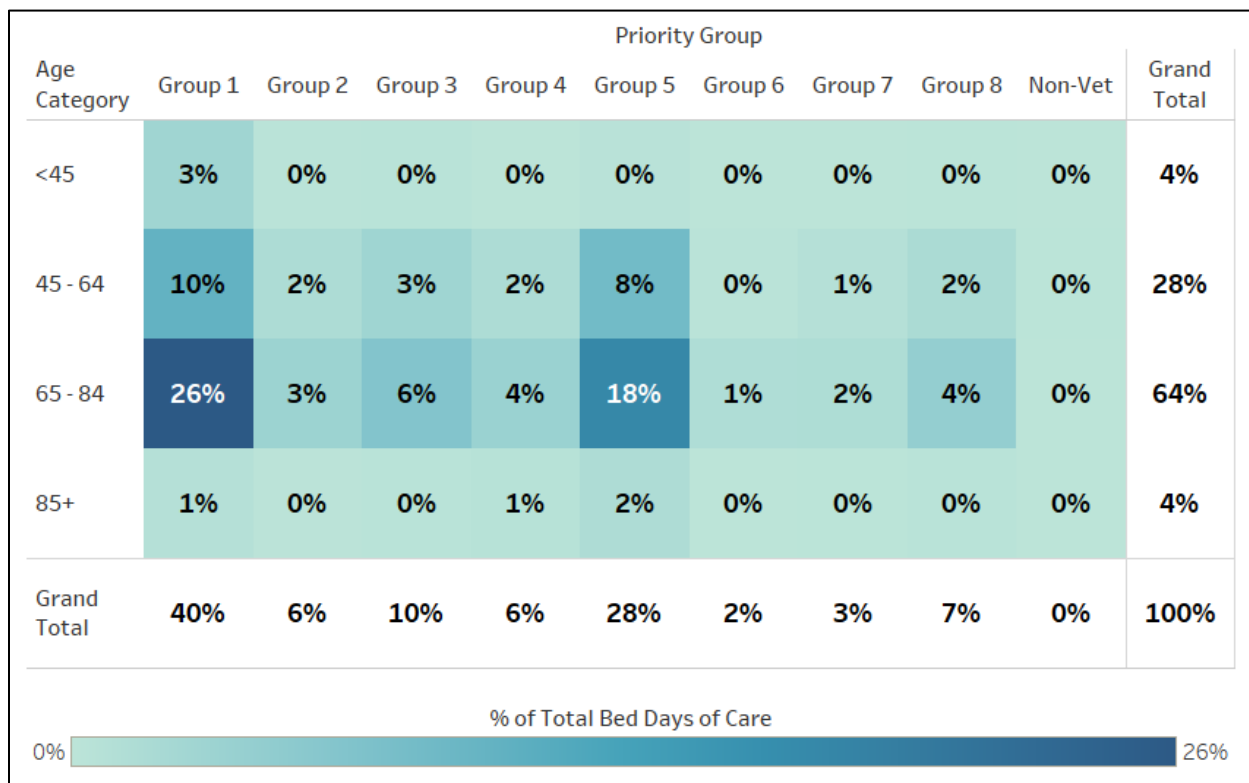
to surgery, as Figure 2 shows the largest cohort (40.0%) of surgical Bed Days of Care (BDOC) in FY 2019 were provided to priority group 1 enrollees.

**Table 1: FY 2019-29 Enrollees by Priority Group**

Priority Group	FY 2019 Enrollees	FY 2029 Enrollees	FY 2019 29 Change
1	2,723,092	4,040,055	48.4%
2	728,892	651,794	-10.6%
3	1,268,741	1,128,910	-11.0%
4	161,625	109,913	-32.0%
5	1,582,218	1,107,306	-30.0%
6	470,744	356,283	-24.3%
7	382,939	378,516	-1.2%
8	1,528,376	960,113	-37.2%
<b>Total</b>	<b>8,846,627</b>	<b>8,732,890</b>	<b>-1.3%</b>

Source: Department of Veterans Affairs EHCPM 2020

**Figure 2: Surgical % of Total BDOC by Age and Priority Group (FY 2019)**



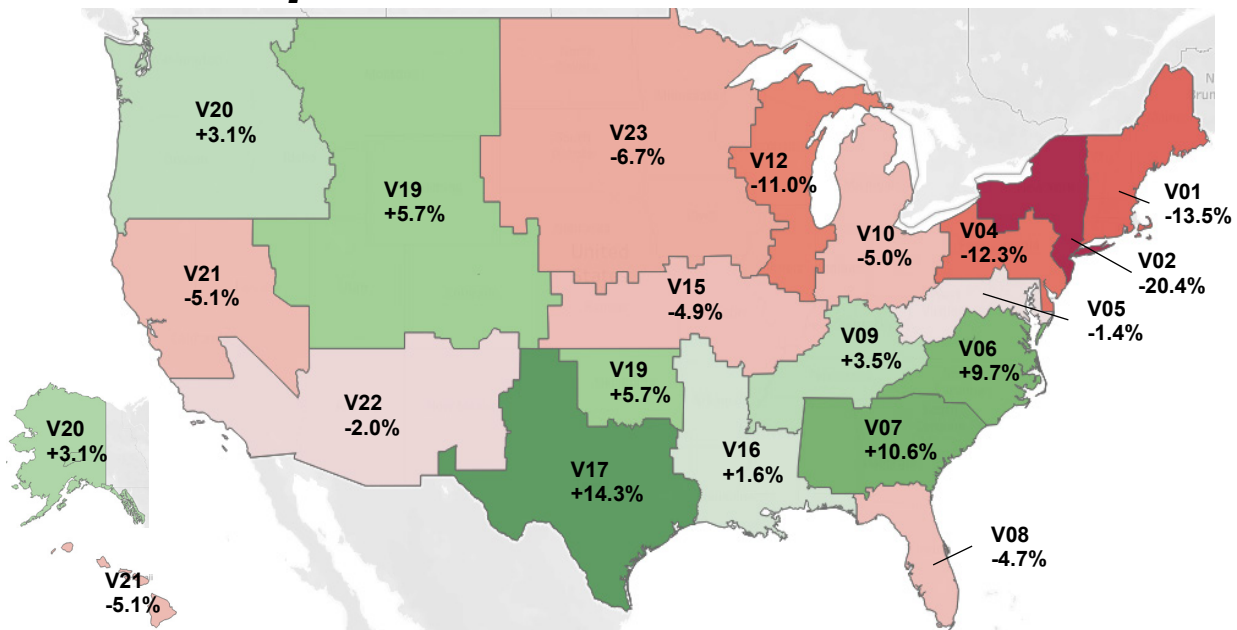
Source: Department of Veterans Affairs Treating Specialty Cube 2019

In FY 2029 the enrollee population will continue to be predominately male (87.8%). Between FY 2019 and FY 2029 the female enrollee population is projected to increase 32.5% to approximately 1.1 million enrollees, while the male enrollee population is projected to decrease 4.7% to approximately 7.7 million.<sup>8</sup>



In addition to demographic shifts within the enrollee population, Veteran enrollment is projected to experience a geographic shift by FY 2029. VISNs located in the Northeast and some Midwest regions are projected to experience substantial decreases in enrollment, while some VISNs located in the Southern and Southwestern regions are projected to have increase significantly. Most notably, VISNs 1, 2, and 4 are projected to decrease by 13.5%, 20.4%, and 12.3%, respectively, by FY 2029, while VISNs 6, 7, and 17 are projected to increase by 9.7%, 10.6%, and 14.3%, respectively. <sup>8</sup>

Figure 3: FY 2019-29 Enrollee Change by VISN



Source: Department of Veterans Affairs EHCPM 2020

### Program Size

In FY 2019, there were 136 facilities across 89 markets in the VHA system with a surgical program. Of the 136 facilities, 109 offered inpatient surgical services and the remaining 27 facilities offered ambulatory services only. <sup>2</sup> Facilities offering surgery previously had been categorized under one of five VHA-defined surgical designations, which indicate the allowable surgical complexity that can be handled at the facility. The surgical complexity designations were Basic Ambulatory Surgery Center (ASC), Advanced ASC, Standard, Intermediate, and Complex Inpatient. Standard, Intermediate, and Complex designations were reserved for facilities offering inpatient surgical care. The VHA operative complexity establishes the required infrastructure, such as OR equipment, OR staffing and staff coverage, sterile processing, anesthesia services, intensive care unit and post-anesthesia space, and additional support service requirements needed for each complexity designation. <sup>2</sup> Of the 109 facilities offering inpatient services in FY 2019, 70 had a Complex designation, 28 had an Intermediate designation, and 11 had a Standard designation. Of the remaining 27 facilities offering outpatient surgical care only, 19 had a Basic ASC designation and eight had an



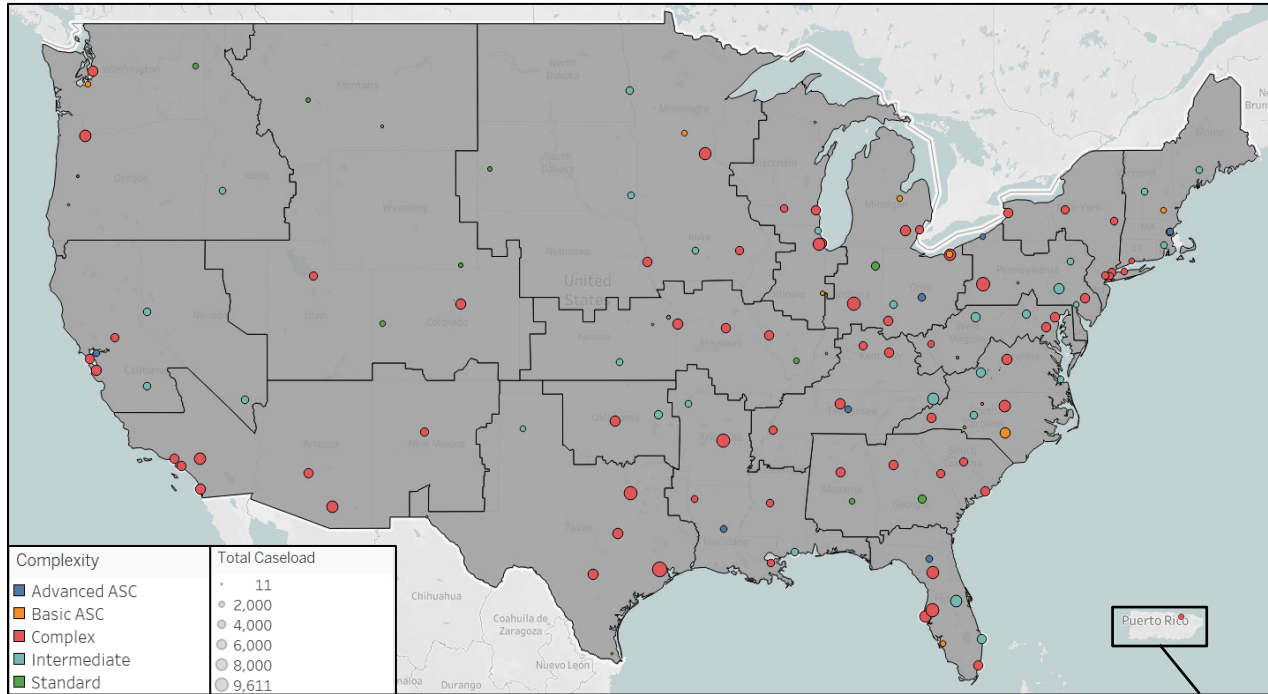
Advanced ASC designation. <sup>2</sup> Revisions to this classification issued in 2019 (and amended in 2020) updated VA facility infrastructure requirements and established a Procedure Infrastructure Matrix, that together with the Invasive Procedure Complexity Matrix, define the Invasive Procedure Complexity Model intended to further ensure that the VA medical facility infrastructure matches the complexity of the planned procedures.

**Table 2: Facilities by Surgical Complexity Designation (FY 2019)**

Surgical Capability	Surgical Complexity Designation	Facilities
Outpatient	Basic ASC	19
	Advanced ASC	8
Inpatient/Outpatient	Standard	11
	Intermediate	28
	Complex	70
<b>Total</b>		<b>136</b>

Source: National Surgery Office 2020

**Figure 4: Surgical Facility Overview (FY 2019)**



Source: National Surgery Office 2020

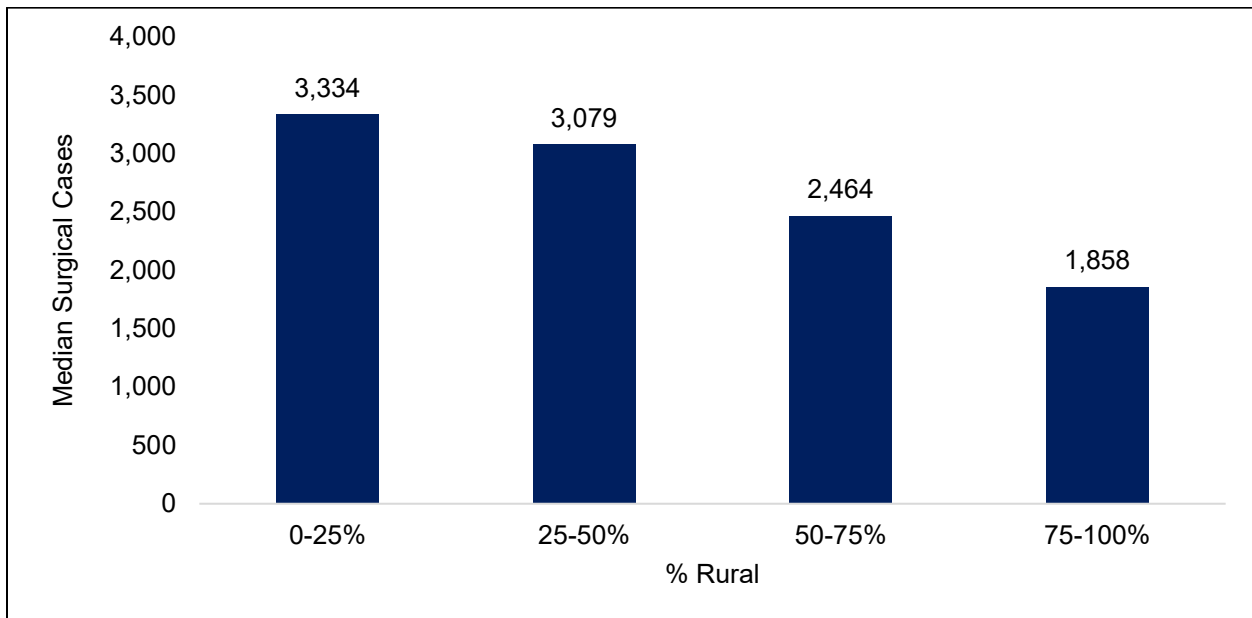
### Rurality

In FY 2018, more than 2.8 million enrollees were living in rural areas, accounting for 32.7% of the total enrollee population. Market rurality ranged from 1.8% rural (02-g Long Island Market), where less than 1,000 enrollees lived in rural areas, to 87.5% rural (12-h Northern Market), where more than 46,000 enrollees lived in rural areas. Overall,



nine of the 18 VISNs had more than 40.0% of their enrollee population living in rural areas of their respective markets.<sup>10</sup> As shown in Figure 5, as market rurality increases surgical caseload performed by VA generally decreases. The median surgical caseload in highly urban markets was 3,334, while the median in highly rural markets was 1,858. However, what is less clear is how rurality impacts Veteran reliance on VA for in-house surgical services. Rurality did not appear to correlate with stronger VA in-house utilization of surgical services among enrollees in FY 2019. Statistically significant positive correlation was not found between market rurality and total market surgical case volume per 1,000 market enrollees [ $r(89) = .18, p = .077; \alpha = 0.05$ ].<sup>10, 8, 1</sup>

Figure 5: FY 2019 Median Caseload by Market Rurality



Source: Department of Veterans Affairs 2018

Similarly, surgical Average Daily Census (ADC) is highest in urban markets and tends to decrease as market rurality increases. This is likely attributed in part to the fact that urban markets generally have more enrollees than rural markets. Table 3 shows the count of VAMCs by surgical ADC and market rurality. Overall, VAMCs with inpatient surgical capabilities appear in all market types, from urban to highly rural. More than one third (37.5%) of VAMCs across the system are in urban markets, while the approximate remaining two-thirds are distributed between blended and rural markets.<sup>10 11</sup>



Table 3: Surgical ADC by Market Rurality (FY 2019)

ADC	Urban Markets		Rural Markets		Total
	(0-25%)	(26-50%)	(51-75%)	(75-100%)	
0	1	3	2	1	7
0.1-2.9	6	6	11	1	24
3-12	18	15	14	0	47
13-24	13	10	3	0	26
25-36	3	4	0	0	7
37-48	1	0	0	0	1
<b>Total</b>	<b>42</b>	<b>38</b>	<b>30</b>	<b>2</b>	<b>112</b>

Source: Department of Veterans Affairs 2018, Department of Veterans Affairs 2020

Note: The total number of VAMCs with surgical beds according to the PTF Cube is 112, while data collected from NSO suggests there are 109 inpatient surgical sites.

### Access

Under the MISSION Act, new eligibility criteria for Veterans to receive care in the community became effective June 6, 2019. One key aspect that Community Care eligibility established was new access standards based on drive times rather than distance. For specialty care services such as surgery, Veterans are now eligible to receive care in the community if the average drive time to a VA site of care is outside of 60 minutes.<sup>12</sup>

The average number of enrollees within each of the 89 VHA markets with a VA surgical presence in FY 2019 was 97,092, while the average number of enrollees within 60 minutes surrounding a VA surgical site was 52,826.<sup>13</sup> Some markets have multiple surgical programs, and these sites may or may not have an enrollee population within 60 minutes that overlaps with another surgical site. Overall, 32 of the 89 markets have more than one surgical program.<sup>1</sup> While the 60-minute drive time standard exists to measure access to specialty care, it appears that Veterans are accessing VA surgical services, especially inpatient surgery, from a wider geography. In FY 2019, the median drive time for inpatient surgery from the patient’s origin county to the VAMC was approximately 111 minutes.<sup>14</sup> And although moderate positive correlation was found between enrollees within 60 minutes and total surgical caseload (inpatient and outpatient) in FY 2019 [ $r(136) = .45, p < .001$ ], a stronger relationship appeared between the total number of enrollees in a market and the total caseload of VA surgical sites within a market [ $r(89) = .84, p < .001$ ].<sup>1</sup>

## 2.2 Current VA Program Review and Analysis

### Historical Surgical Demand

VHA has 14 categories for defining in-house surgical cases, as shown in Table 4. Overall, total in-house volume of surgical cases remained flat between FY 2015 and FY 2019, increasing by 0.4%. Of the top specialties by volume, General Surgery decreased 11.1%, while Ophthalmology increased 12.9%.<sup>1</sup> By FY 2019 General Surgery and Ophthalmology, respectively, remained as the highest volume specialties. Urology and



Orthopedic Surgery, the next largest specialties by volume, experienced a decrease in volume of 3.4% and 3.5%, respectively. <sup>1</sup>

**Table 4: FY 2015-19 Total In-House Surgical Caseload by Surgical Specialty**

Surgical Specialty	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2015 19 % Change
Cardiac Surgery	6,316	6,155	6,044	5,689	5,664	-10.3%
ENT	23,764	24,425	23,669	23,618	23,425	-1.4%
General Surgery	99,839	101,431	94,382	92,065	88,732	-11.1%
Gynecologic Surgery	4,474	4,782	4,893	5,595	5,821	30.1%
Incomplete Assessment	69	344	773	567	940	1,262.3%
Neurologic Surgery	9,729	9,705	9,835	9,550	9,291	-4.5%
Ophthalmology	71,932	76,860	78,205	79,327	81,199	12.9%
Orthopedic Surgery	57,440	57,601	55,977	55,894	55,411	-3.5%
Other Specialties	18,054	20,735	22,447	22,524	23,914	32.5%
Plastic Surgery	18,615	18,217	17,846	18,598	17,966	-3.5%
Podiatry	14,888	15,674	15,952	16,379	17,096	14.8%
Thoracic Surgery	6,203	6,453	5,974	5,430	5,121	-17.4%
Urologic Surgery	64,654	64,032	63,730	63,534	62,482	-3.4%
Vascular Surgery	24,140	24,607	24,741	25,067	24,766	2.6%
<b>Total</b>	<b>420,117</b>	<b>431,021</b>	<b>424,468</b>	<b>423,837</b>	<b>421,828</b>	<b>0.4%</b>

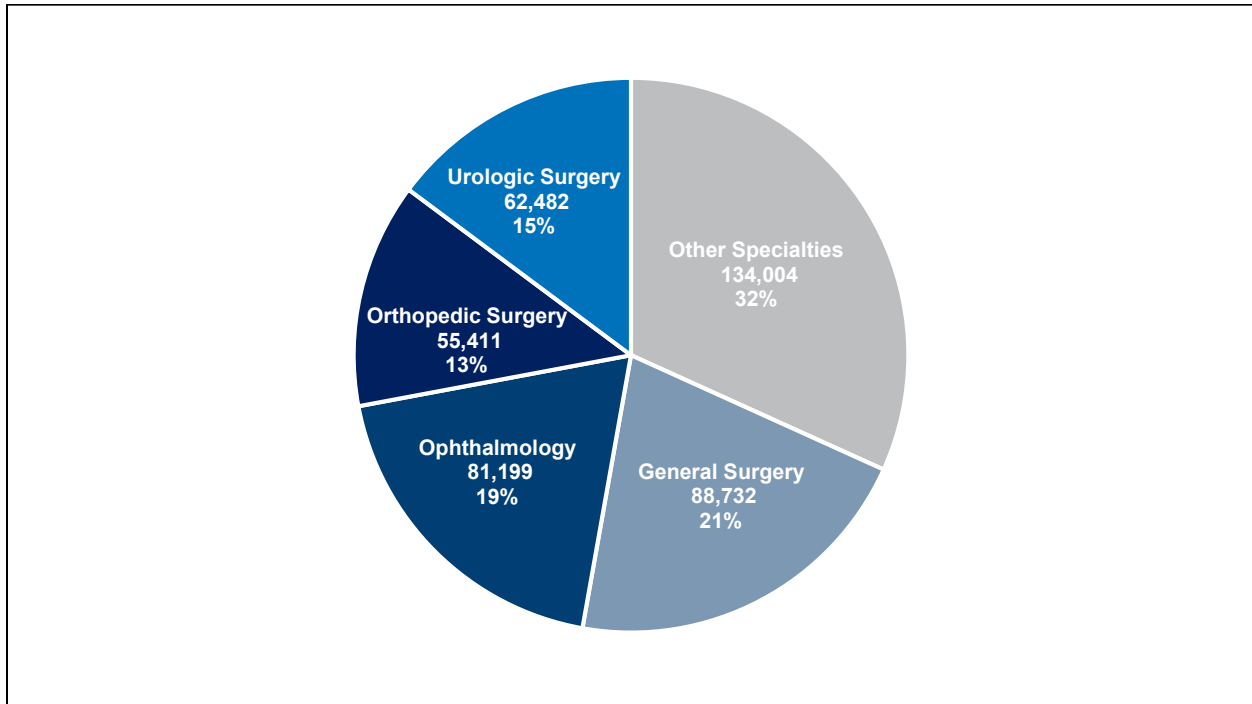
Source: National Surgery Office 2020

The top four VA in-house surgical specialties by volume in FY 2019 were General Surgery, Ophthalmology, Urology, and Orthopedic Surgery, respectively. When combined, the top four specialties comprised 68.2% of total in-house surgical caseload. These top four specialties also ranked at the top for in-house outpatient surgery. The top four specialties for in-house inpatient surgery were Orthopedic Surgery, General Surgery, Vascular Surgery, and Urology, respectively. <sup>1</sup>





Figure 6: FY 2019 Top In-House Surgical Specialties by Surgical Caseload



Source: National Surgery Office 2020

VA surgical care delivery has mirrored commercial health care in shifting from inpatient to outpatient settings. In FY 2019, 76.4% of all in-house surgical cases were performed in the outpatient setting, up from 75.7% in FY 2015. Between FY 2015 and FY 2019, the number of in-house inpatient surgical cases decreased 2.7% while outpatient surgical cases increased 1.1%.<sup>1</sup> As this trend continues it may become apparent that smaller outpatient facilities with less surgical footprint will be more preferable to VA for providing surgical services to appropriate Veteran patient populations, rather than their larger inpatient VAMC counterparts, who will likely be reserved for patients with co-morbidities that preclude them from safely undergoing surgery in an outpatient setting. Of the 109 VAMCs across the system offering inpatient surgical services, the average facility condition assessment deficiency was \$135.5 million and the average age of the main patient care facility was 62 years (average year built: 1959).<sup>15</sup> Together, the combination of shifting surgical care settings and the aging nature of many VA surgical facilities means there is a resulting misalignment between the type of surgical cases performed at VA (primarily outpatient), and the types of facilities where those surgical cases are performed (facilities built primarily for inpatient care).



Table 5: FY 2015-19 In-House Surgical Caseload by Setting

Setting	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2015 19 % Change
Inpatient Cases	101,879	102,912	101,418	100,568	99,148	-2.7%
Outpatient Cases	318,150	327,763	322,276	322,616	321,735	1.1%

Source: National Surgery Office 2020

### Infrastructure

#### ORs and OR Efficiency

In FY 2019, there were 829 active (staffed) ORs across the 136 surgical sites in the VHA system, 756 (91.0%) of which were located in VAMCs with inpatient surgical capabilities. <sup>1</sup>

There is a large variance in the total number of active ORs across facilities of similar complexity designation. The number of ORs at outpatient (Basic ASC and Advanced ASC) facilities ranged from one to seven with a median of two, while the number of ORs at inpatient (Standard, Intermediate, and Complex) facilities ranged from two to 20 with a median of seven. The number of cases at each facility also ranged widely, as seen in Table 6. For example, the number of cases at Basic ASCs ranged from 11 to 4,803 cases. Although this range was widest among Basic ASC facilities, a wide range of case volumes is seen across all complexity designations. Overall, higher complexity facilities tended to have higher case volumes in FY 2019; moderate positive correlation was found between total facility caseload and surgical complexity designation [r(136) = 0.65, p < .001].

Table 6: Total Caseload by Surgical Complexity Designation (FY 2019)

	Basic ASC	Advanced ASC	Standard	Intermediate	Complex
	FY 2019 Cases	FY 2019 Cases	FY 2019 Cases	FY 2019 Cases	FY 2019 Cases
Minimum	11	383	411	1,589	1,134
Median	411	1,988	1,404	2,383	3,883
Maximum	4,803	2,648	3,079	5,861	9,611

Source: National Surgery Office 2020

In FY 2019, VHA providers performed 421,219 surgical cases across the 829 active ORs, for an average of 508 cases per OR. In some instances, ORs were not fully staffed for a minimum of 40 hours per week and may account for some of the noted variance. OR utilization, in terms of caseload per OR, appears to have high variance across the system and across complexity designations. As seen in Table 7, Intermediate and Complex facilities have higher OR utilization than facilities with a lower complexity designation. However, variance within the higher complexity designations still exists. For example, the number of cases per OR at facilities with Complex surgical designations ranged from 189 to 784 with a median of 520. Figure 7 displays this range



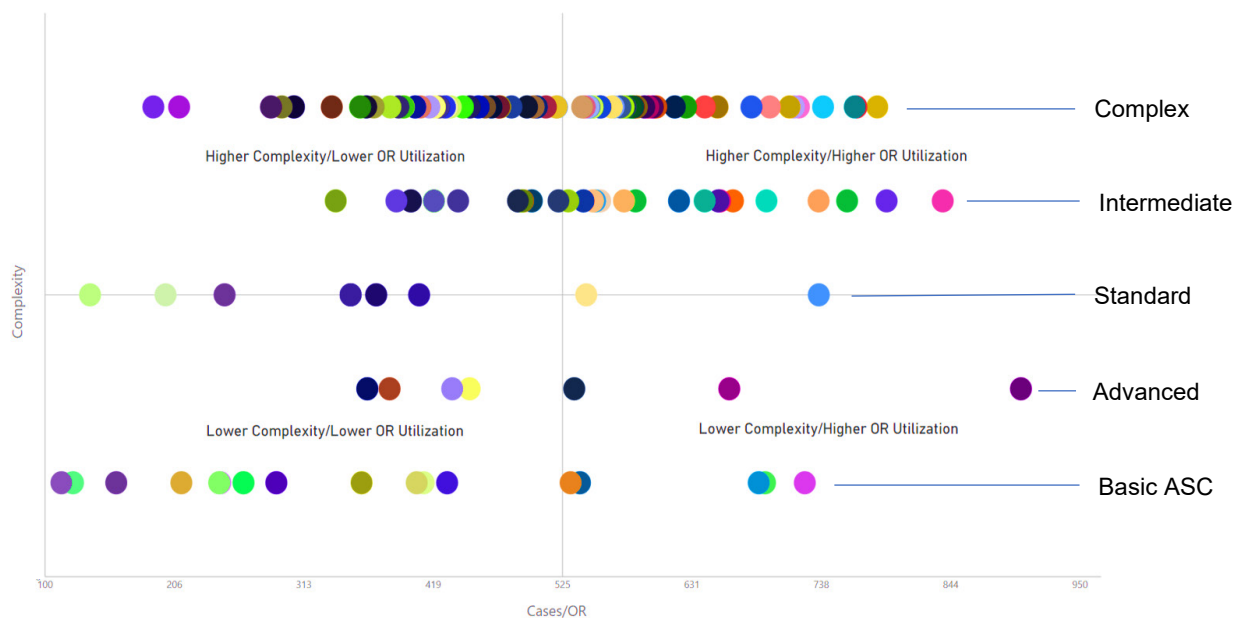
in cases per OR by facility, where the x-axis is cases per OR and the y-axis is the surgical complexity designation.

**Table 7: Cases per OR by Surgical Complexity Designation (FY 2019)**

Minimum	4	365	137	339	189
Maximum	724	1,133	1,026	837	784

Source: National Surgery Office 2020

**Figure 7: Cases per OR and Surgical Complexity Designation by Surgical Site (FY 2019)**



Source: National Surgery Office 2020

### Inpatient Surgical Beds

The total number of inpatient surgical beds is decreasing across the VHA system; however, the rate of decrease in surgical ADC is far outpacing the decrease in beds. Surgical beds across the VHA system decreased 6.2% from 2,842 in FY 2015 to 2,665 in FY 2019. During the same period surgical ADC decreased 21.4% from 1,408 to 1,107.<sup>11</sup>

**Table 8: FY 2015-19 Total Surgical Beds ADC and Occupancy**

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2015 19
Beds	2,842	2,768	2,780	2,754	2,665	-6.2%
ADC	1,408	1,365	1,262	1,175	1,107	-21.4%
Occupancy	49.5%	49.3%	45.4%	42.7%	41.5%	-8.0%

Source: Department of Veterans Affairs 2020



As of FY 2019, there were 2,665 surgical beds across 112 VAMCs in the VHA system; collectively these operating beds had an ADC of 1,107, a 41.5% occupancy rate. The average number of surgical beds and surgical ADC across the system was 23.8 and 9.9, respectively. Table 9 shows the count of VAMCs grouped by surgical ADC and surgical complexity designation. Inpatient programs vary in size, ranging from an ADC of less than 1 to an ADC of 45. Most facilities (69.3%) had a surgical ADC of 12 or less in FY 2019, and half (51.4%) of Complex facilities had a surgical ADC between three and 12. This analysis of surgical inpatient utilization does not include surgical patients admitted to non-surgical services, a trend in clinical care patterns occurring in both community and VHA settings.

Table 9: Surgical ADC by Surgical Complexity Designation (FY 2019)

ADC	Basic ASC	Advanced ASC	Standard	Intermediate	Complex	Total
0	2	0	3	1	0	6
0.1-2.9	0	1	7	16	0	24
3-12	0	0	0	11	36	47
13-24	0	0	0	0	26	26
25-36	0	0	0	0	7	7
37-48	0	0	0	0	1	1

Source: Department of Veterans Affairs 2020

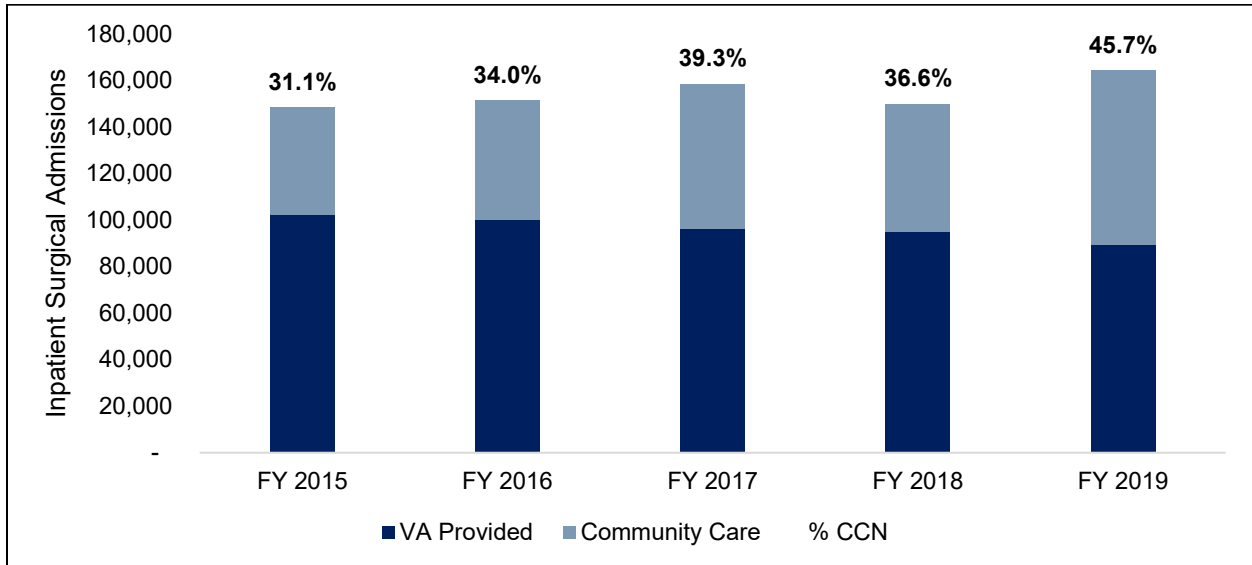
Note: NPS data showed Fayetteville-North Carolina VAMC (#565) as having three surgical beds; this facility does not have a surgical complexity designation.

### Community Care Utilization

Unlike VA’s residential rehabilitation treatment programs, spinal cord injuries and disorders, inpatient blind rehabilitation, and some mental health programs, surgery is not a program unique to VA, and therefore, Veterans frequently have options in the community when seeking surgical care. Whereas Veterans may prefer to seek spinal cord injury care at VA because of its unique characteristics and streamlined continuity of care delivery, surgery tends to be more episodic and therefore Veterans may feel more inclined to seek care based on convenience. <sup>7</sup> Utilization trends for Community Care show that Veterans are increasingly seeking care in the community at facilities which may be more conveniently located to where they reside. Figure 8 and Figure 9 show this pattern of increased utilization. Figure 8 illustrates the number of surgical admissions at VA facilities and at facilities in the CCN. The number of surgical admissions at VA facilities decreased 12.7%, from 102,423 to 89,433 between FY 2015 and FY 2019. Over the same period the number of Community Care admissions rose 62.5% from 46,288 to 75,217. By FY 2019, Community Care admissions represented 45.7% of the total inpatient surgical admissions, a 14.6% increase from FY 2015. Overall, the total number of surgical admissions (VA and CCN) rose 10.7% from FY 2015-19, an increase entirely accounted for by a rise in the number of CCN admissions.



Figure 8: FY 2015-19 Inpatient Surgical Admissions



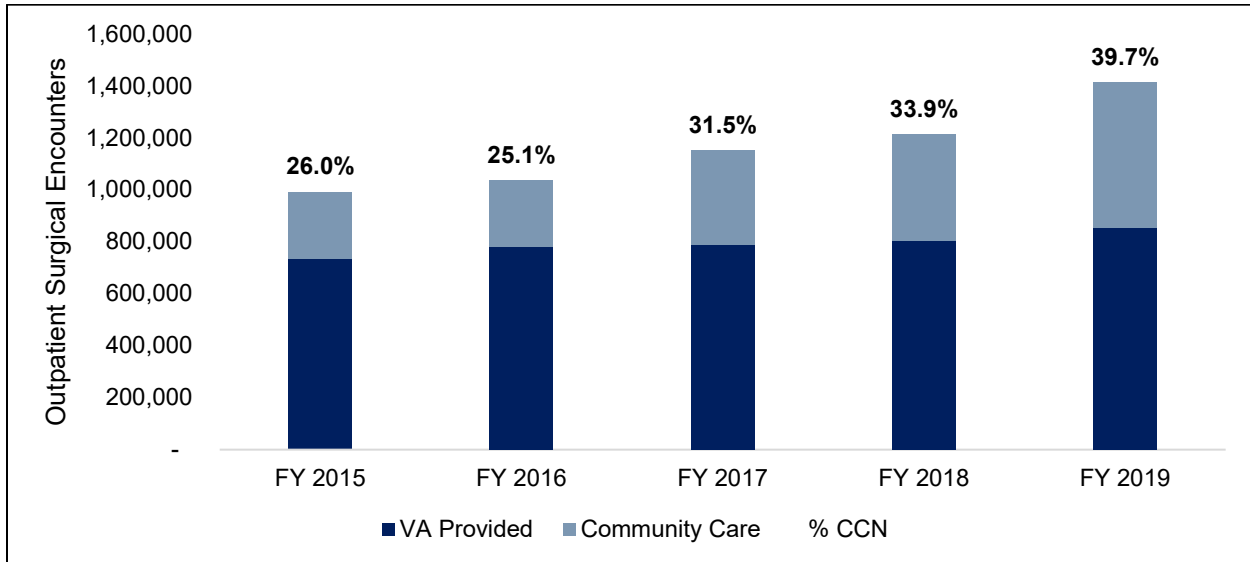
Source: Department of Veterans Affairs 2020

A similar Community Care trend exists for outpatient surgical encounters. Figure 9 shows the number of outpatient surgical encounters at VA facilities and at facilities in the CCN. Between FY 2015 and FY 2019, outpatient surgical encounters increased by 16.0% while during the same period Community Care encounters rose 117.2%. By FY 2019, Community Care surgical encounters encompassed 39.7% of the total outpatient surgical demand, a 13.6% increase from FY 2015. Overall, total outpatient surgical demand (VA and CCN) rose 42.3%, and unlike the situation with inpatient surgery, outpatient demand is increasing at *both* VA and CCN. <sup>16</sup>

Each of these trends shows a significant increase in Community Care utilization for both inpatient and outpatient surgical services. These trends are not associated with a large influx of enrollees entering the system. Between FY 2015 and FY 2019, the total Veteran enrollee population increased 1.6%.



Figure 9: FY 2015-19 Outpatient Surgical Encounters



Note: Surgical Encounters include both surgical cases and related encounters due to surgical episodes of care.  
Source: Department of Veterans Affairs 2020

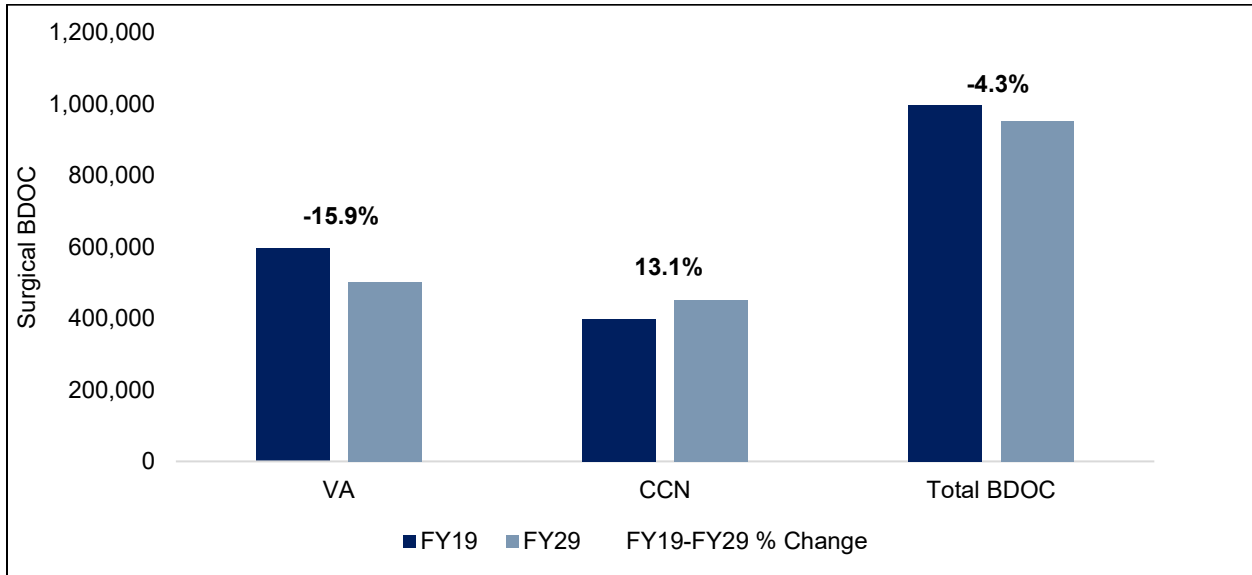
## Projected Surgical Demand

### Inpatient

Historical surgical volume has shown a decrease in VA-provided inpatient surgical care, an overall increase for outpatient surgical care, and collectively, a growing percentage of surgical care being delivered in Community Care settings. The reasons behind these trends are unclear but are likely multifactorial, potentially reflecting access variations as well as possibly patient preferences. These general trends are reflected in the Enrollee Health Care Projection Model (EHCPM) projections. Figure 10 displays inpatient surgical BDOC projections for VA, Community Care, and the total inpatient surgical demand. By FY 2029, overall inpatient BDOC is projected to decrease by 4.3%. Within this decrease, VA provided surgical BDOC is projected to decrease by 15.9% while Community Care BDOC is projected to increase by 13.1%.



Figure 10: FY 2019-FY 2029 VA In-House and CCN Surgical BDOC

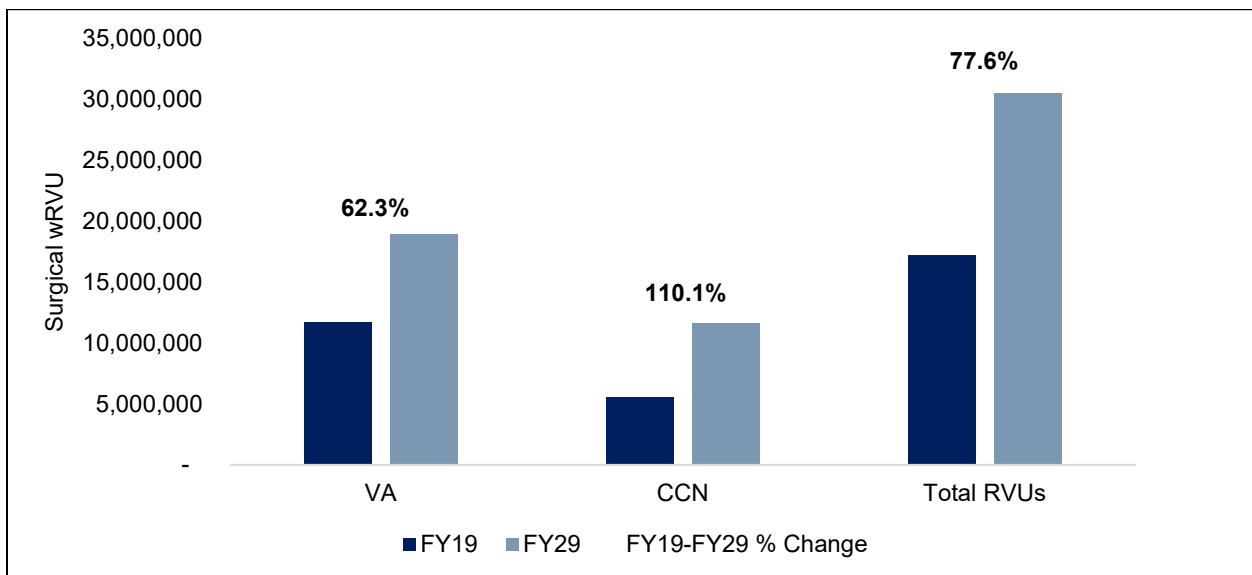


Source: Department of Veterans Affairs EHCPM 2020

### Outpatient

Similar to historical outpatient demand, demand projections indicate an overall increase in both VA and Community Care settings. By FY 2029, total outpatient surgical demand (in work Relative Value Units, wRVUs) is projected to increase 77.6%. Within this large increase, VA-provided outpatient surgical wRVUs are projected to increase 62.3%, while Community Care wRVUs are projected to more than double, increasing 110.1%, as shown Figure 11.<sup>20</sup>

Figure 11: FY 2019-29 VA In-House and CCN Outpatient Surgical wRVUs



Source: Department of Veterans Affairs EHCPM 2020



### Academic Mission

(38 U.S.C § 1204) established that VA must provide assistance in the training of health care providers for the good of VHA and for the good of the nation. <sup>6 17</sup> Since 1946, VA has worked with academic institutions to provide both medical and allied health education to prospective doctors, nurses, and advanced practitioners. According to the Office of Academic Affiliations, over 65.0% of all US-trained physicians have received some form of training at VA. These partnerships between VA and academic medical centers have evolved over time, and today both entities are reliant on each other for different reasons. These partnerships give VA access to some of the premier medical centers across the country. Partnerships with academic medical centers also provide VA the ability to recruit top surgical talent and serve as an aid in medical center staffing. For the graduate medical training programs, these partnerships provide residents with the opportunity to develop their clinical knowledge of health care issues facing Veterans. Jointly appointed physician faculty members conduct research that advances medical science for both Veterans and civilian alike.

Today, VA offers over 17,000 full-time equivalent (FTE) training positions in more than 100 specialties. In FY 2019, there were 2,622 surgical graduate medical education (GME) positions available across the VHA system. The top five largest surgical and related programs by number of training positions were General Surgery (928), Ophthalmology (348), Anesthesiology (363), Orthopedic Surgery (234.3), and Urology (207). <sup>18</sup> These top five programs comprised 68.9% of the total surgical training positions in FY 2019. Overall, these programs appear to align with Veteran surgical demand. Table 10 shows the number of surgical training positions by specialty in FY 2019.

Table 10: Surgical Training Positions by Specialty (FY 2019)

Specialties	FY 2019 Training Positions
ANESTHESIOLOGY	363
CARDIAC SURGERY	28
EAR, NOSE, THROAT (ENT)	161
GENERAL SURGERY	928
NEUROSURGERY	55
OB/GYN	33
OPHTHALMOLOGY	348
ORAL SURGERY	64
ORTHOPEDICS	241
PERIPHERAL VASCULAR	67
PLASTIC SURGERY	87
PODIATRY	0
PROCTOLOGY	2
THORACIC SURGERY	38
TRANSPLANTATION	0
UROLOGY	207
<b>Total</b>	<b>2,622</b>

Source: Department of Veterans Affairs 2019





### Fourth Mission

VHA provides emergency management response and disaster relief in times of crisis. The 1982 VA/Department of Defense (DoD) Health Resources Sharing and Emergency Operation Act (P.L. 97-174) initiated VA’s authority to provide emergency management response support. This authority was further expanded by the Federal Response Plan in 1992. The creation of these laws led to what would become VA’s “Fourth Mission,” which is defined as VA’s effort “to improve the Nation’s preparedness for response to war, terrorism, national emergencies, and natural disasters by developing plans and taking actions to ensure continued service to Veterans, as well as to support national, state, and local emergency management, public health, safety and homeland security efforts.”<sup>19</sup> During the Corona Virus 2019 (COVID-19) pandemic, VA provided Fourth Mission support in many communities. This support included placing both clinical and non-clinical staff onsite or at a VA facility, training in infection control measures, and providing personal protective equipment to other health care organizations. The need for surgical services during a national crisis is undetermined.

### 2.3 Commercial and other Federal Provider Trends

Because the continuum of surgical services for Veterans at VA includes the involvement of both Federal facilities and commercial health care entities, understanding trends and drivers in Federal and commercial settings and how they differ from VA, are important considerations in planning for the future direction of VA surgical services. And while the patient care goals in these different entities largely align, the stakeholders and drivers of these goals differ. Cost management and efficiencies are primary drivers for Federal entities pursuant to policy and regulation, including VA, whereas in the private sector, productivity and profit are the primary drivers.<sup>20</sup>

Table 11: Comparing Balanced Scorecards in the Private and Public Sector

Feature	Private Sector	Public Sector
Focus	Shareholder value	Mission effectiveness
Financial goals	Profit, market share growth, innovation, creativity	Cost reduction, efficiency, accountability to the public
Efficiency concerns of clients	No	Yes
Desired outcome	Customer satisfaction	Stakeholder satisfaction
Stakeholders	Stockholders, bondholders	Taxpayers, legislators, inspectors
Who defines budget priorities	Customer demand	Leadership, legislators, funding agencies
Keys success factors	Uniqueness, advanced technology	Sameness, economies of scale, standardized technology

Source: NRC (2008), p. 68, Mathys and Thompson (2006)

In surgical services, differences between private and public sector health care drivers are even more exaggerated. Revenue from surgical procedures is often a critical component of a private sector institution’s financial statements. The importance of surgical service revenue, particularly from elective procedures, has been highlighted by



the emergence of the COVID-19 pandemic, during which the finances of some hospital systems were so severely harmed by the unexpected cessation of elective operative procedures that they sought and received governmental financial support.<sup>21</sup> This is in marked contrast to Federal entities such as VA, where comparable pauses in surgical services due to COVID-19 had a lesser budgetary effect.

The most consistent and important trend in commercial health care involving surgery has been the continued transition towards ASCs as the site of surgical care and away from both inpatient and outpatient hospital environments. With origins in the 1970s, the efficiencies and cost-savings of ASCs to both providers and payers, including the government, have contributed to the marked increase of both the number of ASCs and the variety of surgical cases being performed in ASC settings. Initially developed by physicians and physician groups seeking greater practice control and autonomy, hospitals and hospital systems have increasingly entered the market. Currently, hospitals have an ownership interest in 21.0% of all ASCs, with 3.0% of ASCs totally owned by hospitals.<sup>22</sup> The estimated cost savings to Medicare, which pays much less for procedures performed in ASCs when compared to hospital reimbursement rates, is currently more than \$2.6 billion annually.<sup>22</sup> If half of current hospital procedures were moved to ASCs, Medicare could save an additional \$2.4 billion per year.<sup>22</sup>

The financial effects on VA from this movement in commercial health care towards surgical care in an ASC environment is not known. Work is underway to align VA cost accounting with commercial cost accounting to provide comparable data for evaluation. Given the high-volume of low-complexity cases that constitute the majority of VA surgical demand, a better understanding of VA costs compared to contracted surgical care costs will be a foundational piece of future surgical planning. Optimizing the provision of surgical services at VA requires all available and emerging data. VA capital and operating costs, plus projections of VA enrollment and utilization, along with the costs of alternatives, will give planners and decision makers the data and metrics necessary to better plan for and efficiently allocate resources on behalf of enrolled Veterans.

### **Commercial, Federal, and Academic Typologies**

Despite its size and expanse, VA relies on commercial health partners as well as other Federal entities to provide surgical services to enrolled Veterans. Ranging from community hospitals and DoD facilities serving Veterans not living within access standard boundaries, to large academic medical centers and teaching hospitals staffed by faculty surgeons who may also have part-time VA appointments, these entities have primary missions that do not entirely align with VA. Federal entities, such as DoD, have a primary mission of deployment readiness, but also provide routine care for active duty service members and their dependents. Academic Medical Centers, while sharing with VA the tripartite mission of patient care, teaching, and education, must also compete with community hospitals for patients and commercial contracts. Planning for surgery at VA must include a thorough evaluation of these commercial and Federal partners and how to best integrate them into the continuum of surgical care at VA.



## Commercial Trends

The ongoing shift in surgical care from inpatient to outpatient hospital and ASC settings is largely the byproduct of technology, which has advanced treatments and techniques both directly in surgery and in perioperative care. This evolution has affected commercial health care entities both large and small, academic, and otherwise. Historically, smaller private-sector community hospitals could keep pace with larger hospital systems in providing common surgical services. However, escalating costs associated with new technology, from equipment such as surgical robots to facility modernization such as the building of “hybrid” surgical suites, make it increasingly challenging for smaller entities to compete with better-capitalized large systems. Measurable demand for services must be rigorously analyzed against investment costs. The net result of this ongoing technological progress has led to the desire to seek even greater efficiencies for lower-complexity, high-volume surgical services in “community” settings, with a corresponding shift of high-complexity, low-volume surgical care towards larger systems and Academic Medical Centers.<sup>23</sup> VA must consider this heterogeneity in the commercial market for surgical services, particularly in light of the increased Community Care options for Veterans, as it determines to how to optimize surgical services for enrolled Veterans.

## Industry Challenges Facing Providers

### *Addressing workforce shortages and increased provider workload*

By 2032, the United States is projected to have a shortage of as many as 23,000 surgeons.<sup>24</sup> This shortage, combined with an aging population with increasingly complex health and surgical needs, together pose significant challenges to maintaining access to necessary surgical care. Health care systems, both commercial and VA, will need to develop strategies to support a declining surgical workforce in the face of a likely expanding workload with mounting quality expectations. To address this issue, the Association of American Medical Colleges and the American College of Surgeons have suggested increasing the number of resident trainees (currently capped) in hospitals to improve all physician shortages, including in surgery.<sup>25</sup> Shortages in the surgical workforce have been endemic at VA, and recruitment and retention of surgeons has been a long-recognized concern.<sup>26</sup>

### *Pursuing rapidly advancing technology*

Pressure on health care organizations to make expensive investments in new and emerging technologies, such as robotic surgical devices and hybrid operating suites, is common. Due to competitive pressures, commercial settings often invest in innovative technology before there is conclusive evidence of benefit.<sup>27 28</sup> Without similar direct competitive pressures, VA may have an opportunity to better evaluate the merits of new technologies and innovations in the context of efficient resource allocation.



### *Effects of COVID-19*

Although unresolved at the time of this writing, commercial health care is still adapting to changes brought about by the COVID-19 pandemic, which included for most hospitals a temporary cessation of elective surgery. In March 2020 the Centers for Medicare & Medicaid Services (CMS) released guidelines recommending postponing or cancelling elective, non-essential medical, surgical, and dental procedures to preserve resources for treating COVID-19 patients.<sup>29</sup> The long term effects of this service contraction on surgical programs is yet to be determined.

### *ASC Investment Decisions*

Many commercial health care systems face investment decisions regarding ASCs. While the trend has clearly been towards more surgical care being delivered in ASC settings, there are additional factors beyond volume that systems consider before making the decision to invest.<sup>30</sup> While some of these factors influencing commercial decisions would be fundamentally different in both substance and magnitude in a VA setting, understanding precisely how those drivers differ will better facilitate how VA best integrates with this future commercial landscape.

### *The shift towards “value-based” reimbursement models*

Financial incentives from payors also contribute to the movement of surgical services to lower-cost outpatient and ambulatory settings. However, the move to value-based care incentives has not yet manifested as a change in overall surgical productivity, largely due to the difficulty in establishing risk-stratified outcome metrics. Value-based incentives in surgery have so far tied portions of reimbursement to process measures, such as adherence to deep vein thrombosis prophylaxis protocols; urinary catheter management; and appropriate antibiotic usage and subjective measures such as patient satisfaction.<sup>21 31</sup> Vertical integration and consolidation trends have the value proposition of improved care coordination and efficiency.<sup>32 33</sup> VA also seeks to enhance the value proposition of care, but will likely require a different set of value metrics than those used in the private sector.

### *Changes in eligibility requirements within the Military Health System (MHS)*

Refinement and clarification of mission responsibilities of the MHS have occurred under the reorganization of the Defense Health Agency (DHA) that includes an increased focus on military readiness which may reduce coverage of retirees as well as non-active duty beneficiaries.<sup>34</sup> VA has collaborative relationships of varying degrees with the DHA at numerous sites, ranging from referrals with DHA providers to facility partnerships for clinical care for Veterans. VA will need to consider how potential coverage changes instituted by DHA may affect care delivery for Veterans.



## Commercial Case Volume

### *Transplantation*

Nationally, there were 39,035 total organ transplants performed in 2020.<sup>35</sup> Kidney, liver, and heart transplants represented the top organ transplantations performed that year with 22,817, 8,906, and 3,658 cases performed respectively.<sup>35</sup> In the commercial sector, the top five performing transplant centers by volume and by region execute an average of 400 annual organ transplant cases. When looking at all 250 transplant centers across the country, not limited to the top five performing centers, the average annual case volume was 156.

**Table 12:** Average Annual Organ Transplants Performed at Transplant Centers by Region

Region	States Included	Average Annual Transplant Cases Performed (2020) *
1	CT, Eastern VT, ME, MA, NH, RI	177.2
2	DE, DC, MD, NJ, PA, WV, Northern VA	423.5
3	AL, AR, FL, GA, LA, MS, PR	548.2
4	OK, TX,	409.2
5	AZ, CA, NV, NM, UT	596.0
6	AK, HI, ID, MT, OR, WA	198.2
7	IL, MN, ND, SD, WI	397.6
8	CO, IA, KS, MO, NE, WY	362.8
9	NY, Western VT	335.4
10	IN, MI, OH	483
11	KY, NC, SC, TN, VA	473.2
<b>ALL Regions</b>		<b>4,404.3</b>
<b>Average</b>		<b>400.4</b>

Source: Organ Procurement and Transplantation Network (OPTN), 2020

\*Based on top five transplant centers with the most organ transplants performed

## Key Metrics in Commercial Settings

### *Revenue, Productivity and Efficiency*

Commercial health care systems need both timely and accurate data to evaluate the performance of surgical service lines and to inform decision making and planning. Both revenue and direct and indirect expenses are important factors in service line management decisions. VA does not rely on surgical service revenue in the same way commercial entities do, yet has expenses related to surgical services that are comparable to commercial entities, and a similar need to allocate resources responsibly.



### *Access to Surgical Services*

Geographic disparities in access to surgical care exist nationwide, particularly in rural and underserved areas. Congress, as a component of the Affordable Care Act, authorized the Health Professional Shortage Area Surgical Incentive Payment Program, an initiative intended to incentivize surgeons to provide surgical care in these underserved Health Professional Shortage Areas.<sup>36</sup> The surgical staffing challenges in rural communities are further compounded by under-resourced hospitals often unable to provide a rudimentary infrastructure for even basic surgical procedures. And analogous situation exists within VA, as nearly 2.8 million, or 32.7%, of Veteran enrollees are located in rural areas. The shortage of surgeons and surgical services in these locations presents barriers for civilians and Veterans alike in accessing care and creates disparities in health care not shared with those living in more populous urban areas.

### *Quality and Satisfaction Measures*

The emergence of value-based reimbursement models has driven the need to develop quantifiable measures of quality beyond financial metrics. Examples of quality measures include surveys of patient satisfaction and risk-adjusted outcomes, but also include indirect process metrics. CMS' Quality Payment Program intends to reward value and quality with payment increases, through participation in the Merit-based Incentive Payment System.<sup>37</sup>



## 3. Leading Practices

### 3.1 Leading Practices Analysis

Identifying leading practices in surgery, both in and outside of VA, can help VA inform a successful national planning strategy for surgery. Establishing a framework of best practices and structured approaches to surgical care, which includes the development of a minimum viable surgical program, will ensure that current facilities are being well-utilized and future facilities are built to meet demand.

#### **Best Practices**

Surgical services are a pillar of profitability for many commercial health care organizations. Hospital leadership focuses on streamlining perioperative processes and implementing best practices to make ORs more efficient, through building support among physicians to reduce supply costs, adjusting and blocking OR times to prevent gaps in utilization, controlling turnover times, and testing surgical equipment ahead of cases to prevent potential delays.<sup>38</sup> Inefficiencies in OR management are multifactorial and unlikely to be resolved by a simple, universally-applicable solution, either at VA or in commercial health care settings.<sup>39</sup>

#### *Structured Approaches to Surgical Planning*

In addition to making ORs more efficient, health care organizations are looking more critically at demographics and demand data to justify the need for new surgical services. The Indian Health Service (IHS), for example, requires that a facility documents the cost of alternate care in the market, distance from and availability of that care, block scheduling, staff recruitment and retention, and revenue generation possibilities in addition to population-based episode projections prior to approval of a new surgical service.<sup>40</sup> Unlike IHS, VA's Strategic Capital Investment Planning process places less of a focus on staff recruitment and retention when making the case to build new ORs, although surgeon shortages have been known to be a chronic challenge to the ability of VA to provide surgical care.<sup>41</sup>

#### *OR Efficiency Thresholds*

Another approach used by health care organizations, both commercial and Federal, are OR efficiency thresholds. Thresholds establish a minimum annual caseload per OR. This helps leadership and planners match demand and associated workload with the proper sized facilities and staffing. Thresholds also help identify which facilities in their networks are underperforming from a utilization perspective and allow for staffing and other resource adjustments. Table 13 displays OR benchmarks from both Federal and commercial VA partners.



**Table 13: A Comparison of Annual Case Volume per OR and other OR Standards**

Measure		Commercial Benchmark	DoD Benchmark	IHS Benchmark
Inpatient/Ambulatory	Annual cases	800/OR	800/OR (GME) 1,000/OR (No GME)	750/OR
	Cases per day	Not Available	3.3 (GME) 4.2 (No GME)	3
	Average length of case	Not Available	124 min (GME) 97 min (No GME)	128 min
	Staffed ORs	Not Available	2-3	2
Ambulatory	Annual cases	1,000	1,200	1,000
	Cases per day	Not Available	4.9	4
	Average length of case	Not Available	81.6 min	96 min
	Staffed ORs	Not Available	2	2

Source: Defense Health Agency 2017, Indian Health Service 2019

Despite different data sets and calculation methodologies, commercial, DoD, and IHS health care facilities have arrived at similar case volume per OR benchmarks for each of their respective surgical programs. In the commercial sector, health care facilities generally have a suggested minimum of 800 annual surgical cases per OR to support a minimum of two staffed ORs.<sup>49</sup> DoD has the same minimum annual surgical case benchmark for facilities with GME programs. For facilities without GME programs, DoD requires a 1,000-case minimum, again with at least two ORs. Comparatively, IHS facilities have an annual surgical case benchmark of 750, with a minimum of two ORs.<sup>47 48</sup>

Benchmarks for ASCs are slightly higher. Commercial and IHS health care facilities have a minimum benchmark of 1,000 cases per OR, whereas DoD has a 1,200 surgical case benchmark to support two staffed ORs. Taken in aggregate, these benchmarks can help VA develop and apply quantitative metrics to measure the utilization of facilities across the system and build and staff appropriate capacity.<sup>47 48</sup>

**Quality Measurement and Monitoring**

Surgery-specific quality measures have been historically difficult to implement and validate, due in part to quantifying patient risk and variations in practice patterns by clinicians. VA’s use of Veterans Affairs Surgical Quality Improvement Program (VASQIP), a nationally validated, risk-adjusted, outcomes-based program, provides a means to accurately and objectively measure the quality of surgical care across VA. Merged with the Continuous Improvement in Cardiac Surgery Program, it creates a comprehensive all-specialty surgical database, with data capture and analysis the responsibility of the NSO. As a consequence of the predictive value of this validated





methodology, in commercial settings an analogous program, the American College of Surgeon National Surgical Quality Improvement Program (ACS-NSQIP), has offered a similar means of monitoring surgical quality in non-VA settings, although unlike at VA, participation in ACS-NSQIP is voluntary and far from ubiquitous.

Both VASQIP and NSQIP are intended to provide participating hospitals with tools, analyses, and reports to make informed decisions about improving quality of care. VASQIP has unique strengths in the quality of data collection, risk- and case-mix-adjusted data stratification, and a clinically relevant data collection window that capture a more comprehensive picture of surgical quality.

VA also monitors and surveys Veteran patients regarding their hospital experience with the VA Survey of Health Experiences of Patients (SHEP), which despite some differences in methodology, is used in comparison to the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), a national, standardized survey of hospital patients.<sup>42 43</sup> Taken together, VASQIP and SHEP provide quantitative and qualitative data that can help to evaluate not only objective metrics of quality, but the perceptions of care from the perspective of Veteran patients. The NSO also provides specific directives outlining oversight roles and responsibilities as they pertain to surgical services and programs, although the responsibility of adoption and implementation are affected at the VISN and VAMC level.

In the DoD, a joint venture between the American College of Surgeons and MHS led to the creation of the Knowledge, Skills, and Abilities (KSA) program in 2017, with the goal of optimizing deployment readiness among the MHS medical force.<sup>44</sup> KSAs are linked to procedure codes, which provides the MHS with the ability to tie personnel health care workloads to their military medical readiness while informing decisions for training and skills maintenance, with the potential for creating an environment of standardization, accountability, and quantifiable results. Specialties with KSA definitions include General Surgery, Anesthesia, Orthopedic Surgery, Trauma Surgery, Critical Care, and Emergency Medicine. General Surgery, the most developed specialty, has 487 KSAs, with over 3,000 KSAs across the combat casualty care team.

## **Innovative Surgical Approaches**

### *Hybrid ORs*

Hybrid ORs are surgical theaters equipped with embedded medical imaging modalities such as Computed Tomography, Magnetic Resonance Imaging, intraoperative ultrasound, and fixed and mobile fluoroscopy. The combination of imaging technology within a traditional OR has been postulated to offer benefits ranging from improved patient safety to cost efficiencies. Furthermore, industry proponents have claimed that the use of hybrid versus traditional ORs manifest additional benefits, such as shorter recovery times, shorter lengths of stay, and a lower use of patient management services.<sup>45</sup>



Currently, hybrid ORs are touted to be best suited for Cardiovascular, Endovascular, and Orthopedic trauma procedures.<sup>45</sup> However, investing in a hybrid OR requires significant space, infrastructure, and money. The average cost to construct a new hybrid OR is about 120.0% more than that of a traditional surgical OR. Moreover, the costs to operate each hybrid OR adds 90.0% to standard OR costs.<sup>46</sup> Additionally, depending on the specific technologies installed, installation costs can vary between \$1.2 million to \$5.0 million.<sup>47</sup> As a result, hospitals across the commercial and Federal sectors must consider if this financial expense is justified by demand, outcomes and financial data when determining the need to invest in building hybrid ORs.

### *Emerging Surgical Technology*

The field of surgery has long been a fertile environment for the introduction of emerging technologies into medicine, in some cases with widespread clinical implementation outpacing even the ability of surgeons, professional organizations, and health care systems to conclusively demonstrate either clinical or financial value.<sup>48</sup> For example, the past decade has seen the introduction of surgical robotics into a number of surgical specialties. Surgical robotic systems have tangible implications for VA as they are used in some of the same specialties, such as Urology, General Surgery, and Orthopedics, which comprise a large portion of the current surgical case volume at VA.

Currently the most common surgical robotics system available is the da Vinci Surgical System from Intuitive Surgical, which since its introduction has found applications across a number of surgical specialties in varying practice environments, including at VA. Extensive peer-reviewed articles examining both the clinical efficacy and cost effectiveness of the use of a robotic-assisted system have returned mixed results. Studies that report cost effectiveness nearly always note that the benefits are only realized when the fixed costs of a robotic implementation are spread across a high volume surgical environment.<sup>49 50 51 52</sup> Researchers also found the use of robotic surgery systems to be more expensive than conventional surgery methods even though they are reimbursed the same. In the absence of clinical efficacy data and health care value common with new or emerging technologies, VA would benefit from instituting an objective, structured, and thorough data-driven methodology to evaluate the potential costs, benefits, and alternatives to all new technologies. Taking a strategic approach to technology adoption will inform VA's surgical services planning and ultimately optimize research allocation.



## Service Planning Framework

### 4.1 Program Priorities

Current priorities of the NSO include:

- Continue partnerships with VISNs to define and implement regional and market-based strategies for surgical specialty care consistent with surgical National Planning Strategy.
- Enhance the VHA surgery quality program to include disease-specific and patient-reported outcomes in all care locations.
- Support integrated surgical care models within regions/markets to facilitate VISN/facility decisions.
- Refine and report surgical utilization and efficiency analytics and benchmarks.
- Support and advocate for surgery-related education and research programs consistent with VA mission.

### 4.2 Market Typologies

#### Market Rurality

Across the VHA system, surgical sites of varying complexity designation exist in all market types, from highly urban to highly rural. Facilities with a Complex designation tend to be located in more urban markets, while facilities operating with a lower complexity designation tend to operate in more rural markets, as shown in Table 14. In 2019, this classification was expanded to include infrastructure requirements and complexity designations for non-surgical invasive procedures.<sup>53</sup> As previously noted in Section 2.2, and as shown in Figure 12, a general trend exists between rurality and surgical cases volume. Surgical case volume generally decreases as market rurality increases [ $r(89) = .27, p = .001; \alpha = 0.05$ ].<sup>10, 8</sup>

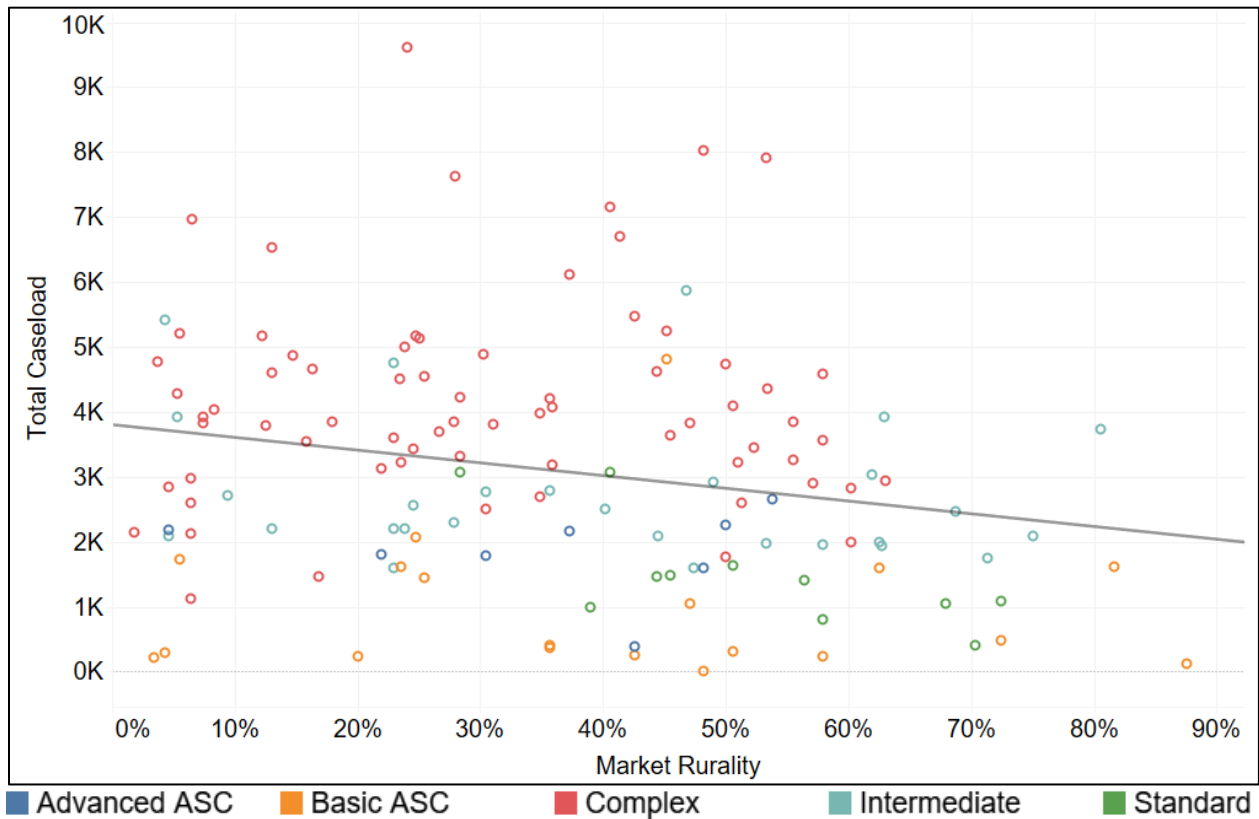
**Table 14:** *Surgical Complexity Designation and Market Rurality (FY 2019)*

Surgical Complexity Designation	Number of Facilities	Market Rurality (Median)	Median Caseload
Complex	70	28.1%	3,883
Advanced ASC	8	39.9%	1,988
Intermediate	28	42.4%	2,383
Basic ASC	19	42.5%	411
Standard	11	50.6%	1,404

Source: Veterans Health Administration 2020, Department of Veterans Affairs 2018



Figure 12: Total Surgical Caseload and Market Rurality (FY 2019) <sup>1, 10</sup>



Source: Department of Veterans 2018, National Surgery Office 2020

### *Inpatient and Outpatient Surgical Programs*

As of 2019, 13 of 96 markets had no VA inpatient surgical program and seven had no VA surgical program at all. Of the 89 markets with a surgical program, 83 had at least one facility in the market with an inpatient program. <sup>2</sup> The remaining six markets operated with an outpatient (ASC) surgical presence only, and each of these markets had one surgical site. Three programs were based out of VAMCs, while the other three operated out of Health Care Centers. Overall, markets operating only with an ASC tended to be smaller than average: in 2019 markets without an inpatient surgical presence had an average enrollee population of approximately 50,000, versus the average market enrollee population of approximately 97,000. <sup>8</sup> In addition, these markets tended to be more rural than others with an inpatient surgical presence, where approximately 49.0% of enrollees lived in rural areas versus approximately 37.0% among markets offering inpatient surgery. <sup>8, 10</sup>

### *Inpatient and Outpatient Drive Time Analysis*

Median drive times for enrollees accessing inpatient surgical services at VA, particularly for the higher volume specialties such as General Surgery, Urology, and Orthopedics, is approximately 60 minutes. <sup>14</sup> This may reflect Veterans choosing Community Care for relatively commonplace surgery if VA care is more than 60 minutes away. For higher



complexity specialties such as Neurosurgery, Thoracic Surgery, and Cardiac Surgery, possible explanations behind longer median drive times may be longer wait times in the community for these higher complexity services, or lack of closer Community Care options. In some instances, Veteran preference also may be contributing to the longer drive times.

Surgical service areas describe logical, demand-based catchment areas for locating surgical specialties. They reflect a combination of demand (case volume), staffing availability, and drive time which describe where to offer services. For example, the relatively low volume of Gynecology cases, both inpatient and outpatient, contribute to the categorization of the specialty as a regional service.

Table 15: Median Drive Time from Patient County to VA Facility for Inpatient Surgical Services (FY 2019)

Treating Specialty Name	FY 2019 Inpatient Cases	Median Drivetime	Service Area
Podiatry	4,829	50.2	Market
General Surgery	21,748	57.9	Market
Gynecologic Surgery	950	60.6	Regional
Urologic Surgery	13,051	60.6	Market
ENT	3,420	61.9	VISN
Orthopedic Surgery	21,776	62.7	Market
Ophthalmology	784	63.0	Market
Plastic Surgery	1,970	65.8	VISN
Neurologic Surgery	5,691	70.2	VISN
Thoracic Surgery	3,409	80.9	Regional
Cardiac Surgery	4,688	107.5	Regional
Transplantation	Not Reported	380.8	Regional

Source: Department of Veterans Affairs 2020

Outpatient drive times for surgical services mirror the distribution seen for inpatient, with median drive times for the busier surgical specialties again around 60 minutes, and longer for the same higher complexity specialties.<sup>54</sup> This reflects the fact that the majority of VA surgical cases, both inpatient and outpatient, are performed in the same surgical facilities in ORs that serve both inpatient and outpatient needs. Only 27 of the 136 VA surgical sites nationwide offer outpatient-only surgical services, and together these facilities comprise a small portion of the total outpatient surgical workload. Similarly, the factors behind the drivetime findings for outpatient surgery are likely the same as inpatient surgery. Veterans can select Community Care options in instances when care at VA facilities involves either a wait time greater than 28 days, is beyond the 60-minute drive time, or when VA providers determine it is in the Veterans best interest. Of note is that these MISSION Act criteria for access based on drive time or wait time apply strictly to VA; Community Care wait times are not defined.



Table 16: Median Drive Time from Patient County to VA Facility for Outpatient Surgical Services (FY 2019)

Stop Code	FY 2019 Outpatient Cases	Median Drivetime
(411) PODIATRY	12,267	53.9
(410) PLASTIC SURGERY	15,996	57.6
(404) GYNECOLOGY	4,871	57.6
(401) GENERAL SURGERY	66,984	58.5
(405) HAND SURGERY	Not Reported	59.2
(403) OTOLARYNGOLOGY (ENT)	20,005	60.1
(407) OPHTHALMOLOGY	80,415	61.1
(409) ORTHOPEDICS	33,635	62.0
(415) VASCULAR SURGERY	9,448	63.7
(414) UROLOGY	49,431	64.1
(413) THORACIC SURGERY	1,712	65.8
(406) NEUROSURGERY	3,600	76.4
(486) CARDIOTHORACIC SURGERY	Not Reported	79.2
(402) CARDIAC SURGERY	970	88.3
(487) BARIATRIC SURGERY	Not Reported	90.5
(488) SURGICAL ONCOLOGY	Not Reported	90.9

Source: Department of Veterans Affairs 2020

Note: The stop codes listed include both surgical and non-surgical outpatient encounters.

### 4.3 Planning Guidelines and Thresholds

Planning guidelines and thresholds seek to inform the market assessment process. The rationale for establishing VA planning guidelines and thresholds is rooted in the belief that where a VA service falls below the identified measure, quality, patient safety, or operational efficiency may be compromised. Therefore, a service must be carefully examined to ensure that Veteran needs are appropriately met. Planning guidelines and thresholds focus on a broad range of access, demand, staffing, quality, and facilities/ environment of care considerations and are meant to help identify areas where the teams should carefully consider measurable performance indicators. The guidelines and thresholds developed are not meant as standalone decision criteria to be used to make specific recommendations.

When conducting the market assessments, the opportunities developed were standardized across a range of move (or strategic task) types. Those developed included major moves as well as opportunities defined to be addressed during the ordinary course of business. Major moves represent the platform which will be vetted with senior VA leadership, with the VHA Under Secretary of Health, the Secretary of VA, the Asset and Infrastructure Review (AIR) Commission, and ultimately with Congress.



Planning guidelines derived from these efforts have been designed to assist in the standardization of major market moves and include the following:<sup>1</sup>

- **Open** – Establish a new site or program in an area with no current surgical services
- **Maintain:**
  - **Maintain** – no major move is recommended
  - **Resize** – maintain services at the current site and size appropriately to accommodate projected demand
  - **Add Surgical Specialty** – maintain services at the current site and add a surgical specialty (may involve building new ORs)
  - **Relocate Program** – maintain services within the same geographic service area but relocate to another VA site
  - **Relocate Facility** – maintain services and relocate the site within the same county to better place services closer to where Veterans live or to a site that can better fit services
  - **Modernize Facility** – update environment of care by improving or adding new building systems without changing the function of the existing space
  - **Replace Facility** – applicable for standalone programs – maintain services within the same area in a new facility due to the current facility’s inability to modernize efficiently
- **Partner** – create a partnership where VA providers deliver care in coordination with a partner or where VA transitions care to a partner
  - **Partner (VA Delivered)** – a partnership in which VA providers deliver care to Veterans in coordination with a partner, such as through a VA hospital within a hospital (HwH) on a partner hospital campus, credentialing VA providers within a partner facility, or establishing a VA point of care within a partner space
  - **Partner (CCN/AA/Federal)** – transition care from a VA site and from VA providers to the Community Care Network, an Academic Affiliate, or to Federal providers and facilities; VA provides care coordination but does not deliver clinical care

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<sup>1</sup> All National Planning Strategy service planning guidelines may not include all major market move types



The primary considerations in planning for the provision of surgical services (opening, closing, or modifying programs) at VA are optimizing access and quality for eligible Veterans, both current and forecasted, in addition to optimizing operational efficiencies. Demographics can be used to identify locations where eligible Veterans reside outside of standards for either access or acceptable quality surgical care. These thresholds can be used in quadrennial assessments and other planning exercises to guide surgical service decisions.

It is understood that the planning guidelines, and thresholds outlined are not intended to serve as absolute and independent metrics in decision making as applied to the development of high performing integrated delivery networks at VA. Those decisions are anticipated to consider relevant site-specific considerations, stakeholder input, and additional local factors deemed relevant in achieving the overarching goals of improved access and quality of surgical care.

### Planning Guidelines Table

#### *VAMC (Inpatient and Outpatient Surgical Program)*

MAHSO Planning Guidelines and Thresholds	
<b>Service</b>	Surgery
<b>Geography</b>	Market and Facility
<b>Prerequisites</b>	N/A

Open		
Planning Domain	Planning Guideline	Rationale
Demand	31,400 (10-year) projected enrollees in the market to establish two general ORs at 800 cases per OR per year.  Use multiples of the enrollee threshold to establish additional ORs to meet future demand, rounding up. Each additional OR will support demand for 800 cases.	Based on FY 2015-19 VA in-house surgical utilization among VAMCs performing inpatient and outpatient surgery.
Supply	At least 1.4 surgeon FTE per specialty can be staffed once facility is built.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	The facility is centrally located in an area with a large relative enrollee population in the future (10-year) and the community is unable to meet Veteran demand.	Signals that the availability of inpatient surgical services in the community is unable to accommodate current and future Veteran demand, and that a VA presence is needed.





Open		
Planning Domain	Planning Guideline	Rationale
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Maintain Resize		
Planning Domain	Planning Guideline	Rationale
Demand	<p><b>Decrease Active ORs:</b> At least 1,600 surgical cases per year.</p> <p>Reduce the number of active ORs to accommodate 800 cases per OR.</p> <p><b>Build additional ORs:</b> ORs are all operating at or above 800 cases/OR annually.</p>	<p>Equates to two ORs operating at 800 cases annually. This case minimum (threshold) is the same or near equivalent to DoD, IHS, and private sector targets (See Table 18)</p> <p>Resizing aligns operating costs with surgical demand.</p>
Supply	At least 1.4 surgeon FTEs per specialty can be staffed.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	N/A	
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Maintain Relocate		
Planning Domain	Planning Guideline	Rationale
Demand	<p>Greater than 1,600 surgical cases per year at the existing facility.</p> <p>Determine the number of ORs using current demand from the existing facility. Divide annual case volume by 800 to determine quantity of ORs, rounding up.</p>	Equates to two ORs operating at 800 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector.
Supply	Minimum surgeon FTE per specialty is 1.4.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	Proposed site is able to maintain or increase the number of enrollees within 60 minutes of the surgical site for Veterans in the future (10-year).	Ensures that access to the same services are maintained or improved.



Maintain Relocate		
Planning Domain	Planning Guideline	Rationale
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Maintain Add Surgical Specialty (without additional specialty OR requirement)		
Planning Domain	Planning Guideline	Rationale
Demand	N/A	
Supply	Minimum surgeon FTE per specialty is 1.4	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	N/A	
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Maintain Add Surgical Specialty (with additional specialty OR requirement)		
Planning Domain	Planning Guideline	Rationale
Demand	Greater than 1,600 surgical cases per year AND case minimums per specialty OR can be met in addition to 1,600 surgical cases (See Table 2).	Equates to two ORs operating at 800 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector.
Supply	At least 1.4 surgeon FTEs per specialty can be staffed.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	N/A	
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	



Partner VA Delivered		
Planning Domain	Planning Guideline	Rationale
Demand	<p><b>Urban Market:</b> Fewer than 1,600 total surgical cases annually.</p> <p><b>Rural Market:</b> Fewer than 1,600 surgical cases <u>and</u> procedures annually.</p>	<p>Equates to two ORs operating at 800 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector.</p> <p>Given that rural markets generally have fewer surgical cases, procedural volume may also be included in case counts.</p>
Supply	Minimum surgeon FTE per specialty is 1.4.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	The partner site can meet 1.2x current and future (10-year) BDOC demand and is at least CMS 3 Star <u>and</u> The Joint Commission (TJC) accredited, and within 60 minutes of the current site.	Signals that the availability of inpatient surgical capacity at the partner site can accommodate current and future Veteran demand.
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Partner AA / Federal / CCN (Buy)		
Planning Domain	Planning Guideline	Rationale
Demand	<p><b>Urban Market:</b> Fewer than 1,600 surgical cases annually.</p> <p><b>Rural Market:</b> Fewer than 1,600 surgical cases <u>and</u> procedures annually.</p>	<p>Equates to two ORs operating at 800 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector.</p> <p>Given that rural markets generally have fewer surgical cases, procedural volume may also be included in case counts.</p>
Supply	Minimum surgeon FTE per specialty is 1.4.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	The current number of beds at commercial facilities (that are at least CMS 3 Star <u>and</u> TJC accredited) within 60 minutes of the current site can meet 1.2x current and future (10-year) Veteran demand.	Signals the availability of inpatient surgical services in the community can accommodate current and future Veteran demand.



Partner AA / Federal / CCN (Buy)		
Planning Domain	Planning Guideline	Rationale
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

*APC (Outpatient Only Surgical Services)*

MAHSO Planning Guidelines and Thresholds		
Service	Surgery	
Geography	Market and Facility	
Prerequisites	N/A	
Open		
Planning Domain	Planning Guideline	Rationale
Demand	<p>34,720 non-overlapping FY 2019 enrollees within 60 minutes of the proposed site to establish two general ORs at 1,000 cases per OR. Non-overlapping enrollees are enrollees not already within a 60-minute drive time to another VA surgical facility.</p> <p>Apply 10-year projected enrollee change of the county where the facility is located to the current number of enrollees within 60 minutes. Proceed if projected enrollee value is above 34,720 threshold.</p> <p><b><u>AND</u></b></p> <p>Proposed site does NOT warrant establishment of facility with inpatient/outpatient capabilities.</p>	<p>Based on VA in-house surgical utilization among VAMCs with Inpatient and Outpatient surgical programs from FY 2015-19. Equates to two ORs operating at 1,000 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector.</p> <p>Overlapping enrollees are those who are within 60 minutes of two surgical sites with overlapping services. Non-overlapping enrollees with another surgical site are used to ensure surgical services are well distributed and are not unnecessarily duplicative.</p>
Supply	At least 1.4 surgeon FTE per specialty can be met once facility is built.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	The facility is centrally located in an area with a large relative enrollee population in the future (10-year) and unmet Veteran demand.	Signals the availability of outpatient surgical services in the community cannot accommodate current and future Veteran demand.
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.



Open		
Planning Domain	Planning Guideline	Rationale
Other	N/A	

Maintain Resize (Decrease Active ORs)		
Planning Domain	Planning Guideline	Rationale
Demand	<p><b>Decrease Active ORs:</b> At least 2,000 surgical cases per year.</p> <p>Reduce the number of active ORs to accommodate 1,000 cases per OR.</p> <p><b>Build additional ORs:</b> ORs are all operating at or above 1,000 cases/OR annually.</p>	<p>Equates to two ORs operating at 1,000 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector (See Table 18).</p> <p>Resizing aligns operating costs with surgical demand.</p>
Supply	At least 1.4 surgeon FTEs per specialty can be staffed.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	N/A	
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Maintain Relocate		
Planning Domain	Planning Guideline	Rationale
Demand	<p>Greater than 2,000 surgical cases per year at the existing facility.</p> <p>Determine the number of ORs using current demand from the existing facility. Divide annual case volume by 1,000 to determine quantity of ORs, rounding up.</p>	Equates to two ORs operating at 1,000 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector.
Supply	Minimum surgeon FTE per specialty is 1.4.	Prevents surgical programs with one surgeon and inconsistent coverage.
Access	Proposed site is able to maintain or increase the number of enrollees within 60 minutes of the surgical site for Veterans in the future (10-year).	Ensures that access to the same services are maintained or improved.
Quality	N/A	



Maintain Relocate		
Planning Domain	Planning Guideline	Rationale
Other	N/A	Age and condition of the facility does not warrant investment.

Maintain Open Additional Surgical Specialty		
Planning Domains	Planning Guideline	Rationale
Demand	N/A	
Supply	At least 1.4 surgeon FTEs per specialty can be staffed.	To prevent surgical programs with one surgeon and inconsistent coverage.
Access	N/A	
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

Partner VA Delivered		
Planning Domain	Planning Guideline	Rationale
Demand	<p><b>Urban Market:</b> Fewer than 2,000 total surgical cases annually.</p> <p><b>Rural Market:</b> Fewer than 2,000 surgical cases <u>and</u> procedures annually.</p>	Equates to two ORs operating at 1,000 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector. Given that rural markets generally have fewer surgical cases, procedural volume may also be included in case counts.
Supply	Fewer than 1.4 surgeon FTE of the surgical specialty.	To prevent surgical programs with one surgeon and inconsistent coverage.
Access	The partner site is willing to provide OR time to meet 1.2x current and future (10-year) demand and is a facility that has (CMS 3 Star if in an inpatient facility) TJC accreditation and within 60 minutes of the current site.	Signals the availability of outpatient surgical services in the community can accommodate current and future Veteran demand.
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	



Partner AA / Federal / CCN (Buy)		
Planning Domain	Planning Guideline	Rationale
Demand	<p><b>Urban Market:</b> Fewer than 2,000 surgical cases annually.</p> <p><b>Rural Market:</b> Fewer than 2,000 surgical cases <u>and</u> procedures annually.</p>	Equates to two ORs operating at 1,000 cases annually. This case minimum (threshold) is the same or near those used by DoD, IHS, and in the private sector. Given that rural markets generally have fewer surgical cases, procedural volume may also be included in case counts.
Supply	Fewer than 1.4 surgeon FTE of the surgical specialty.	To prevent surgical programs with one surgeon and inconsistent coverage.
Access	The current and future (10-year) outpatient surgical RVU being generated at the facility does not exceed 10.0% of the total RVUs currently being generated at community providers within 60 minutes of the facility.	Signals the availability of outpatient surgical services in the community can accommodate current and future Veteran demand.
Quality	N/A	Surgical quality is monitored and managed by NSO through VASQIP.
Other	N/A	

### Detailed Planning Guidelines Rationale

#### *Demand Thresholds*

#### *Case Volume per OR*

#### VAMC (Inpatient and Outpatient Surgical Program)

Threshold: 1,600 total surgical case volume minimum (two general ORs at 800 cases per OR annually)

#### *Establishing Specialty ORs at VAMCs*

Specialty ORs would be considered if there is sufficient demand (case volume) required to support a Specialty OR(s). (See thresholds below). Any specialty OR would be built in addition to demand required for a minimum viable program utilizing two general ORs.

The increasing influence of technology on surgery is creating a demand for operating room designs that accommodate technology needs that are unique and specialty specific. These needs are case-specific within a specialty, that is, not all cases performed by a specialty require a specialty OR, thus the Open Thresholds listed are for those cases that are determined to *require* a specialty OR for optimal management.



Table 17: Specialty ORs with Surgical Case Benchmarks

Specialty OR	Open Threshold*
Orthopedic	500 Cases Annually
Hybrid	500-800 Cases Annually**
Urology	500 Cases Annually
Cardiothoracic	250 Cases Annually
Neurosurgery	250 Cases Annually
Robotics	250 Cases Annually
Transplant	50 Cases Annually

\*Threshold is in addition to the 1,600-case volume minimum.

\*\*Hybrid OR demand would be based on the predominant specialty using the OR, and the average case length for that specialty

Note: Specialty ORs are from the Surgical and Endovascular Services Design Guide

### APC (Outpatient Only Surgical Services)

Threshold: 2,000 case volume minimum (two general ORs at 1,000 cases per OR annually)

#### *Assumptions and Rationale*

Case volume per OR thresholds were developed based upon benchmarks established by Federal partners (DoD and IHS) as well as generally accepted benchmarks in the private sector. Table 18 compares VA’s surgical case volume thresholds to those set by commercial and Federal partners. Impacts of variations in case types, graduate medical education mission, and support staffing are not considered. Annual case volume for general ORs in VAMCs operating with inpatient and outpatient surgical capabilities use similar methodologies to IHS and DoD. The VA threshold assumes eight-hour operating days at 250 OR operating days annually, with a planning capacity of 85.0% and an average case length of 128 minutes. These assumptions average 3.2 cases/OR per day for a total of 800 cases/OR annually.





**Table 18: VA Case Volume Thresholds vs. Federal and Commercial Partners**

	VA	DoD	IHS	Commercial
<b>Inpatient and Outpatient Surgical Program (General OR)</b>				
Annual cases	800 Cases/OR	800 Cases/OR (GME) 1,000 Cases/OR (No GME)	750 Cases/OR	800 Cases/OR
Cases per day (average)	3.2 Cases/OR	3.3 Cases/OR (GME) 4.2 Cases/OR (No GME)	3 Cases/OR	Not Reported
Minimum Staffed ORs	2	2	1	1
Average length of case* (approx.)	128 min (2.1 hours)	124 min (GME) (2.1 hours) 97 min (No GME) (1.6 hours)	128 min (2.1 hours)	Not Reported
Operating Days	250	240	250	Not Reported
Planning Capacity	85.0%	85.0%	80.0%	Not Reported
<b>Outpatient Surgical Program (APC)</b>				
Annual cases	1000 Cases/OR	1,200 Cases/OR	1,000 Cases/OR	1,000 Cases/OR
Cases per day (average)	4.3	4.9	4	Not Reported
Minimum Staffed ORs	2	2	2	2
Average length of case* (approx.)	102 min (1.6 hours)	81.6 min (1.4 hours)	96 minutes (1.6 hours)	Not Reported
Operating Days	250	240	250	Not Reported
Planning Capacity	85.0%	85.0%	80.0%	Not Reported

Source: Guidehouse 2020, Defense Health Agency 2017, Indian Health Service 2019

\*Includes turnover time

**Enrollee Thresholds**

**VAMC (Inpatient and Outpatient Surgical Program)**



Threshold: A minimum of 31,400 FY 2029 enrollees in the market are necessary to establish two general ORs at 800 cases per OR.

Use multiples of the enrollee threshold to establish additional ORs to meet future demand, rounding up. Each additional OR will support demand for 800 cases.

#### APC (Outpatient Only Surgical Services)

Threshold: A minimum of 34,720 non-overlapping FY 2019 enrollees within 60 minutes of the proposed site to establish two general ORs at 1,000 cases per OR. Non-overlapping enrollees are enrollees not already within a 60-minute drive time to another VA surgical facility.

Apply 10-year projected enrollee change of the county where the facility is located to the current number of enrollees within 60 minutes. Proceed if projected enrollee value is above 34,720 threshold.

#### *Assumptions and Rationale*

Enrollee thresholds were based on VA in-house utilization of surgical services from FY 2015-19.

Furthermore,

- VAMC thresholds were based on utilization at the market level among VAMCs performing inpatient and outpatient surgery during all five years. Utilization was determined by dividing the number of surgical cases for a given year by the number of enrollees in the market for the same year. A trimmed mean was taken of utilization across the five-year period, which excluded the top and bottom five percent. The annual case volume per OR threshold (800) was divided by the utilization rate then multiplied by two. The result yielded the average number of enrollees in a market to achieve 1,600 cases, or two ORs operating at 800 cases per OR.
- The APC threshold calculation followed the same methodology but used the number of enrollees within 60 minutes of surgical sites and the number of outpatient surgical cases performed during all five years. Unlike the VAMC threshold, the number of enrollees within 60 minutes was used because it assumes that the APC facility will be utilized by those primarily within 60 minutes of the facility. When analyzing outpatient surgical enrollee utilization at the market level within 30, 60, and 90 minute drive times of a site, the number of enrollees within 60 minutes of the surgical site resulted in the strongest positive correlation [ $r(135) = .40, p < .001$ ]. The annual case volume per OR threshold used in this calculation was 2,000 cases, or two ORs operating at 1,000 cases per OR. Since the APC threshold is determined by the number of enrollees within 60 minutes of the proposed site, overlapping enrollees, or those who are within



60 minutes of two surgical sites, were excluded. Using non-overlapping enrollees increases the probability that surgical services are well distributed and not unnecessarily duplicative.

Enrollee thresholds are based on historic in-house surgical utilization over a five-year period and reflect the prior five-year surgical utilization as of the date of this report. Updating utilization data is suggested to reflect the most current surgical utilization and normalize for factors other than patient demand that could influence in-house utilization, for example staffing volume changes, and so forth.

## Supply Thresholds

### *Surgical FTE per Specialty*

Threshold: 1.4 surgeon FTE per surgical specialty

### *Assumptions and Rationale*

This threshold describes the minimal surgical provider FTE per specialty that supports service continuity and inconsistent coverage enhances access. Achieving this threshold may rely on multiple providers, each with various time commitments to VA. Additionally, market-based specialty staffing, including virtual care modalities, may be considered.

## Access Thresholds

### *VAMC (Inpatient and Outpatient Surgical Program)*

Threshold: The current number of beds at commercial facilities (that are at least CMS 3 Star and The Joint Commission accredited) within 60 minutes of the current site can meet 1.2x current and future (10-year) Veteran demand without exceeding 85.0% occupancy.

If more than one VAMC provides surgical services in a market, calculate market share by dividing the number of surgical cases done at the facility by the total number of VA in-house surgical cases done in the market. Apply that market share rate to the market level BDOC projections and assume that the number of beds at community providers remains constant.

### *APC (Outpatient Only Surgical Services)*

Threshold: The current and future (10-year) outpatient surgical RVU being generated at the facility does not exceed 10.0% of the total RVUs currently being generated at community providers within 60 minutes of the facility.

If multiple VA facilities provide outpatient surgical services, calculate market share by dividing the number of outpatient surgical cases done at the facility by the total number of VA in-house outpatient cases done in the market. Apply that market share rate to the market level RVU projections.



### *Assumptions and Rationale*

The access thresholds consider both capacity and quality among community facilities and providers in addition to access to surgical services. By considering only providers within 60 minutes of the current site, access to surgical services can be maintained. Facility quality is accounted for by considering only those inpatient facilities with a CMS rating of 3 stars or higher and TJC (or equivalent) accreditation, and ambulatory facilities that meet or exceed industry standards for safety and quality. Finally, community capacity is determined by assessing occupancy of surgical beds for inpatient surgery and surgical RVU capacity for outpatient surgery. Inpatient capacity to provide care for Veterans in the community is defined as 85.0% of the total number of acute care beds, minus the current average daily census, for all CMS 3 Star, TJC accredited, acute care hospitals within 60 minutes of the current site. The “1.2x” current and future demand factors for an additional 20.0% of Veteran demand is intended to ensure that community facilities have an adequate capacity to accommodate future growth and demand. Outpatient capacity in the community is determined by comparing the number of surgical RVUs at the VA facility and comparing it to the total surgical RVUs being generated in the community at facilities within 60 minutes of the current site. If the current and future number of surgical RVUs coming from the VA facility exceeds 10.0% of the total surgical RVUs being generated in the community within 60 minutes, it is determined that the community does not have available capacity to meet Veteran demand. The concept for this threshold originated from MHS while determining the potential impact of transitioning beneficiaries to specialty care providers in the community. Although this methodology is similar, MHS measured the beneficiary population as a percent of the total population within 60 minutes. The methodology recommended in this document strays away from using beneficiaries and instead uses surgical RVUs in order to better estimate the surgical need of the population. <sup>55</sup>

### **Quality Thresholds**

Threshold: Assessments of surgical quality are based upon applicable independent accreditation standards, while for providers compliance with relevant professional certifications and institutional and network credentialing comprise a quality threshold. A more detailed level of quality monitoring occurs for both facilities and providers at VA with the VASQIP program

### *Assumptions and Rationale*

The Veterans’ Administration Health-Care Amendments of 1985 (Public Law 99- 166) requires that the Secretary of the Department of VA maintain a quality assurance program to monitor and evaluate the quality of health care provided by VA. The Under Secretary for Health is required to maintain and collect a compilation of mortality and morbidity standards for each type of surgical procedure performed by hospitals within VHA. VHA’s VASQIP, and the Continuous Improvement in Cardiac Surgery Program were developed to meet this mandate and are recognized as validated measures of process and outcomes in surgery.



Frontline assessment of surgical quality on a provider level remains the purview of the credentialing and peer review processes in place at each VAMC. Surgical departments, specialty surgical programs, VAMCs, and VISNs have resources available from the NSO, in addition to VASQIP, to monitor quality and outcomes, and altogether have in place processes intended to promote the development of a high reliability, high performing integrated delivery network. For non-VA facilities and providers, quality monitoring relies on hospital standards measures such as TJC accreditation, and for providers national and state-level licensure in addition to facility credentialing and peer review implement a multilayered approach to monitor clinical quality. VA retains a responsibility for oversight and monitoring of these quality assessment processes employed by these non-VA entities.

### **Other Considerations**

Access standards for care established under the MISSION Act are legislatively subject to review and potential modification no less than every three years.<sup>56</sup> Thus, it is possible that specific access metrics, such as average drive times, that directly influenced the development of the current thresholds, may change. Such changes may in turn warrant modifications in the thresholds identified in this report. Similarly, changes in Veteran eligibility criteria could potentially alter the number of Veterans eligible for surgical care, and as a result influence surgical services utilization, and again, require changes to the current thresholds.

Virtual or emerging integrated care delivery models, as approved by the NSO, should be considered when meeting staffing thresholds.

While costs associated with the provision of surgical care at VA, both in-house and via Community Care, are a vital consideration in VA budget allocations, the planning guidelines described intend to optimize Veteran access to high quality surgical services. The cost of care would be another consideration.

Advances in medical and surgical care, will almost certainly merit modification to these thresholds to maintain their relevance. Likewise, unique typographies, such as academic affiliate partnerships or surgical care in significantly rural settings, may present unusual staffing and should be considered accordingly.



## 5. Future Program Planning

### 5.1 Applying the Surgery National Planning Strategy to VA Market Assessments

The VA MAHSO effort completed an initial assessment of VA markets, facilities, and service lines to produce recommendations for the design of high-performing integrated delivery networks. VA Leadership identified select service lines, studied during the market assessments, for development of a standard national strategy and approach to planning and maintaining programs. Surgery was identified as a service line requiring a set of national planning guidelines and thresholds that would be applicable for use in current (MAHSO) and future planning efforts.

This document, the Surgery National Planning Strategy, establishes the definitive, consistent planning guidelines to be used for all VA surgical planning efforts moving forward.

The national planning guidelines will be used to ensure that the final market assessments apply standardized programmatic criteria across the nation, but with full consideration of the range of care archetypes that exist within VA. The guidelines will be useful to VA planners to inform future quadrennial market assessments and other planning exercises.

#### **How will MAHSO apply the Surgery National Planning Strategy?**

The four-step process for revisiting MAHSO draft opportunities describes how surgery-specific opportunities will be reviewed and updated, if necessary.

##### *1. Review Phase 1-3 Market Assessment Data and Surgery Opportunities*

The scope of review will include revisiting Phase 1-3 markets, re-assessing all market opportunities using new thresholds and data (as applicable), and potentially developing new opportunities.

##### *2. Apply Surgery Planning Guidelines*

For each market and applicable draft surgery opportunity, the planner will review market assessment data and apply surgical planning guidelines. The reassessment will include any new data sources in the updated methods described previously. Next, planning guidelines developed here (demand, supply, access, quality, and mission, and other applicable MISSION Act § 203 criteria) will be applied to existing opportunities.

##### *3. Update/Create Surgery Opportunities*

As needed, existing market optimization or capital opportunities will be revised. In addition, after application of the planning guidelines and thresholds, new surgery opportunities may also be created.



#### *4. Review and Finalize with VHA Leadership*

Once draft opportunities are revised or developed and are ready for VA Leadership approval, a review with the Chief Strategy Office (CSO), VHA Leadership, and the VISN Directors will move the opportunities towards finalization.

### **Conclusion**

The National Planning Strategy for Surgery, created in conjunction with the NSO, is a framework for designing consistent service delivery planning for surgical services. Based on NSO program priorities, the Surgery National Planning Strategy provides guidance on how surgical programs can respond to varied market demands and trends while optimizing VA resources in a Veteran-centric framework. These guidelines and thresholds will be used to ensure that capital planning is matched to Veteran demand and a consistent set of recommendations is established to inform and support the development of the National Realignment Strategy.



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## Appendix B: Interviews

Office	Interviewee	Title/ Position	Date(s)
NSO	Dr Mark Wilson	Executive Director, NSO	Various
NSO	Dr. William Nylander	Assistant Director, NSO	Various



## Appendix C: Acronyms

ADC	Average Daily Census
APC	Ambulatory Procedure Center
ASC	Ambulatory Surgery Center
BDOC	Bed Days of Care
CCN	Community Care Network
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare & Medicaid Services
COVID-19	Coronavirus Disease 2019
DHA	Defense Health Agency
DoD	Department of Defense
EHCPM	Enrollee Health Care Projection Model
ENT	Ear/Nose/Throat
FTE	Full-Time Equivalent
FY	Fiscal Year
GME	Graduate Medical Education
IHS	Indian Health Service
KSA	Knowledge, Skills, and Abilities
MHS	Military Health System
MISSION Act	Maintaining Internal Systems and Strengthening Integrated Outside Networks Act
NSO	National Surgery Office
NSQIP	National Surgical Quality Improvement Program
ORs	Operating Rooms
RVU	Relative Value Unit
TJC	The Joint Commission
VA	Veterans Affairs
VAMC	Veterans Affairs Medical Center
VASQIP	Veterans Affairs Surgical Quality Improvement Program
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Networks