

# A National Survey of Veterans Affairs Medical Centers' Cardiology Services

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A survey found that of cardiology services were widely available at facilities across the US Department of Veterans Affairs, but the types of services varied considerably based on facility complexity.

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The US Department of Veterans Affairs (VA) remains the largest integrated health care system in the US serving 9 million veterans. Two recent studies that compared 30-day mortality and readmission rates between VA and non-VA hospitals among older men with acute myocardial infarction (AMI), and heart failure (HF). The studies found that hospitalization at VA hospitals was associated with lower risk-standardized 30-day all-cause mortality rates for MI and HF when compared with hospitalization at non-VA hospitals.<sup>1,2</sup>

However, it is unknown whether the delivery of cardiovascular care is optimized in the VA system. For example, in comparisons between generalist-led hospitalized care for MI and HF, several studies have demonstrated that cardiology-led care has been associated with lower rates of mortality.<sup>3-5</sup> Although data on the types of cardiac technology and use of cardiac procedures were described previously, we have not found detailed information on the types of inpatient cardiology services provided at VA medical centers nationwide.<sup>1,6,7</sup> To develop further improvements in delivery of cardiovascular care within the VA, a better understanding of the types of resources that are currently available within the VA system must be made available. In this article, we present results of a national survey of cardiology services at VA facilities.

## METHODS

From February to March of 2017, we conducted a comprehensive nation-wide survey of all VA facilities to quantify the availability of cardiology services, excluding cardiothoracic surgical services. The survey questions are listed in the Appendix. The chief of medicine and the chief of cardiology were each e-mailed 3 times

at every facility. If no response was received from a facility, we e-mailed the chief of staff 3 times. If there still was no response, the remaining facilities were contacted by phone and study authors (PE and WB) spoke to individuals directly regarding the structure of cardiology services at a facility. Responses were categorized by facility level of complexity. Complexity designation was determined by the VA Central Office (VACO)—level 1 facilities represent the most complex and level 3 facilities are the least complex. VACO also divides facility complexity into sublevels, for example level 1A facilities generally are associated with academic medical centers and provide the highest levels (tertiary or quaternary) of care.<sup>8</sup>

Results were coded according to a predetermined rubric for how cardiology services are structured (admitting service, consult service, inpatient, outpatient, other) and for how they were

**TABLE 1**  
**Response Rates by Facility<sup>8</sup>**

Complexity Level <sup>a</sup>	Facilities, No.	Response Rate, No. (%)
1A	40	40 (100)
1B	21	21 (100)
1C	24	23 (96)
2M	24	20 (83)
3L	30	18 (60)
<b>Total</b>	<b>139</b>	<b>122 (88)</b>

<sup>a</sup>Complexity level ranged from 1A (highest acuity patients with availability of multiple subspecialty service) to 3L (lowest acuity type patients and minimal subspecialty services) based on the level of complexity classification at the time of the survey, which has since been updated.

staffed (attending only, house staff, or advanced practice providers (APPs). After the first wave of surveys, 2 additional questions were added to the survey tool; these asked about employed vs contracted cardiologist and use of APPs. The results were tabulated and simple percentages calculated to express the prevalence of each structure and staffing model.

The study was reviewed and approved by the University of Utah/Salt Lake City VA Medical Center joint institutional review board and all authors completed human subjects research training.

## RESULTS

Study authors initially identified all 168 VA medical center facilities operating in 2017. Initial polling revealed that multiple facilities either were substations or had agreements for cardiology services from larger facilities, with 1 facility having 2 campuses with different levels of service at each. After adjusting for these nuances, the total number of potential respondents was 139. We obtained a response from 122 of the 139 facilities for an overall survey completion rate of 88%. Response rates varied by complexity level (Table 1). The survey received responses from all Level 1A and 1B facilities, 96% from Level 1C facilities; 83% (20/24) from level 2 facilities, and 62% (18/30) from level 3 facilities. (Please note that in the reference document providing detailed descriptions of the VA level of complexity has different numbers for each facility type given that there has been reassignments of the levels since our survey was completed.)<sup>8</sup>

We were specifically interested in inpatient cardiology services and whether facilities provided only consult services or inpatient services led by a cardiology attending. Having inpatient services does not exclude the availability of consult-liaison services (Table 2).

Higher complexity facilities (1A and 1B) were more likely to have dedicated, cardiology-led inpatient services, while lower complexity facilities relied on a cardiology consult service. Two-thirds of Level 3 facilities did not have inpatient cardiology services available.

Dedicated cardiovascular care unit (CCU)

TABLE 2

### Inpatient Cardiology Services by Facility Complexity

Complexity <sup>a</sup>	Total No.	Inpatient Service			Inpatient Consult, No. (%)	No Inpatient Cardiology Services, No. (%)
		CCU, No. (%)	Floor, No. (%) <sup>b</sup>	Both, No. (%)		
1A	40	33 (83)	18 (45)	18 (45)	40 (100)	0
1B	21	11 (52)	7 (33)	7 (33)	21 (100)	0
1C	23	3 (13)	1 (4)	1 (4)	23 (100)	0
2M	20	0	2 (10)	0	17 (85)	3 (15)
3L	18	0	0	0	6 (33)	12 (67)
<b>Total</b>	<b>122</b>	<b>47 (39)</b>	<b>28 (23)</b>	<b>26 (21)</b>	<b>107 (88)</b>	<b>15 (12)</b>

Abbreviation: CCU, cardiovascular care unit, critical care service.

<sup>a</sup>Complexity level based on the level of US Department of Veterans Affairs complexity classification at the time of the survey, which has since been updated.

<sup>b</sup>Floor, regular nursing floor outside of the CCU.

teams were the most common inpatient service provided, present in more than half of all Level 1 facilities and 83% of Level 1A facilities (Table 3). Cardiology-led floor teams were available in 45% and 33% of level 1A and 1B facilities, respectively, but were much less common in Level 1C and Levels 2 and 3 facilities (4%, 10%, 0%, respectively). Only 31% of Level 1 facilities had both a CCU team and a cardiology-led inpatient floor team. Inpatient consulting cardiologists were commonly available at Levels 1 and 2 facilities; however, only 33% of Level 3 facilities had inpatient consulting cardiologists.

Housestaff-managed inpatient services, teams consisting of, but not limited to, medical residents in training, led by a cardiology attending were present in 73% of Level 1 facilities. Interestingly, Level 1B facilities were more likely to have housestaff-led services than were Level 1A facilities (90% and 80% respectively). Inpatient advanced heart failure services were less common and available only in Level 1 facilities. We did not survey the specific details of the other (eg, led by a noncardiology attending physician) models of inpatient cardiology care provided.

Cardiac catheterization (including interventional cardiology and electrophysiology [EP]) services, varied considerably. Ninety percent of Level 1A facilities offered interventional services, compared with only 52% of Level 1C facilities offered interventions. EP services were divided into simple (device only) and complex (ablations). As noted, complex EP services were more common in more complex facilities; for example, 10% of

**TABLE 3**  
**Cardiology Services by Facility Complexity Level**

Service Types	All Level 1, % (n = 84)	Level 1A, % (n = 40)	Level 1B, % (n = 21)	Level 1C, % (n = 23)	All Level 2, % (n = 20)	All Level 3, % (n = 18)
<b>Inpatient Cardiology Services</b>						
CCU team	56	83	52	13	0	0
Floor team <sup>a</sup>	31	45	33	4	10	0
CCU and floor team <sup>a</sup>	31	45	33	4	0	0
Inpatient consult service	100	100	100	100	85	33
An academic/training affiliated VAMC with house staff managed inpatient cardiology service	73	80	90	43	10	0
An Inpatient advanced HF/transplant service	32	40	29	22	0	0
<b>Procedural cardiology services</b>						
Interventional catheter laboratory	79	90	86	52	0	0
Diagnostic catheter laboratory only <sup>b</sup>	10	0	5	30	10	0
Electrophysiology laboratory (devices only, no ablations)	36	20	38	61	10	6
Electrophysiology laboratory (including ablations)	60	83	57	22	0	0
<b>Outpatient cardiology services</b>						
Cardiology consulting service	95	93	95	100	95	89
Cardiology continuity care	99	98	100	100	95	72
<b>Employed vs contract cardiologist</b>						
Employed cardiologist	98	98	95	100	95	83
Contract cardiologist	58	58	62	57	40	17
Both employed and contract	56	55	62	52	40	17
<b>Advanced practitioner support</b>						
Advanced practitioner support on inpatient service	61	65	57	57	25	11
<b>Overall response rate</b>	<b>99</b>	<b>100</b>	<b>100</b>	<b>96</b>	<b>83</b>	<b>60</b>

<sup>a</sup>Regular nursing floor outside of the CCU.

<sup>b</sup>For sites that responded to both diagnostic catheter laboratory only and interventional catheter laboratory the assumption was that they had both diagnostic and interventional capabilities.

Abbreviation: CCU, cardiovascular care unit, critical care service, HF, heart failure; VAMC, US Department of Veterans Affairs Medical Center.

Level 2 facilities offered device placement but none had advanced EP services.

Outpatient services were widely available. Most facilities offered outpatient consultative cardiology services, ranging from 95% (Level 1) to 89% (Level 3) and outpatient cardiology continuity clinics 99% (Level 1) to 72% (Level 3).

Regardless of level of complexity, > 80% of facilities employed cardiologists. Many also used contract cardiologists. No facility utilized only contracted cardiologists. Use of nurse practitioners (NPs) and physician assistants (PAs) to assist with managing inpatient services was relatively common, with 61% of Level 1 facilities using such services.

## DISCUSSION

Studies of patient outcomes for various conditions, including cardiac conditions, in the 1990s found that when compared with non-VA health-care systems, patient outcomes in the VA were less favorable.<sup>9</sup> During the late 1990s, the VA embraced quality and safety initiatives that have continued to the present time.<sup>9,10</sup> Recent studies have found that, in most (but not all) cases, VA patient outcomes are as good as, and in many cases better, than are non-VA patient outcomes.<sup>1,10,11</sup> The exact changes that have improved care are not clear, though studies of other health care systems have considered variation in services and costs in relationship to morbidity and mortality outcomes.<sup>12-14</sup> In the context of better patient outcomes in VA hospitals, the present study provides insight into the cardiology services available at VA facilities throughout the nation.

## Limitations

While this study provides background information that may be useful in comparing cardiology services between VA and non-VA systems, drawing causal relationships may not be warranted. For example, while the literature generally supports the concept of inpatient cardiology services led by an attending cardiologist, a substantial numbers of VA inpatient facilities have not yet adopted this model.<sup>4-6</sup> Even among more complex, level 1 facilities, we found that only 31% offered both an inpatient CCU and floor team service led by an attending cardiologist physician. Thus, 69% of Level 1 facilities reported caring for patients with a primary cardiology problem through a noncardiology admitting services (with access

to a cardiology consultation service). Additional studies should be conducted that would evaluate patient outcomes in relationship to the types of services available at a given VA medical center. Patient outcomes in relationship to service provision between the VA and non-VA health care systems also are warranted.

This study is limited by its reliance on self-reporting. Although we believe that we reached respondents who were qualified to complete the survey, the accuracy of reporting was not independently validated. Further, we asked questions about the most frequent models of cardiology care but may not have captured more novel methods. In trying to keep the survey time to < 2 minutes, we did not explore other details of cardiology services, such as the availability of a dedicated pharmacist, nor more advanced procedures such as transcatheter aortic valve replacement. Additionally, the present study is a snapshot of cardiology services for a given period, and, as noted above, did not look at patient outcomes. Further research is needed to determine which service provided is most beneficial or feasible in improving patient outcomes, which includes examining the various models of inpatient cardiology-led services for optimal care delivery.

## CONCLUSION

Cardiology services were widely available throughout the VA system. However, the types of services available varied considerably. Predictably, facilities that were more complex generally had more advanced services available. Providing a general overview of how cardiovascular care is being delivered currently across VA systems helps to identify areas for optimization within VA facilities of various complexities with initiatives such as implementation of cardiology-led inpatient services, which may be beneficial in improving patient care outcomes as demonstrated previously in other large healthcare systems.

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## APPENDIX

## Survey Questions from National Cardiology Service Survey of VA Medical Centers

Do you have (indicate all that apply)?

- An inpatient CCU team led by a cardiologist
- An inpatient (“floor”) cardiology service (ie, a cardiologist attending is the attending of record, not just consulting)
- Both CCU and floor inpatient cardiology teams led by an attending cardiologist
- An inpatient consulting cardiology service
- Outpatient consulting cardiology service
- Outpatient, ongoing cardiology care
- Interventional cardiology catheter laboratory (stents, etc.)
- Diagnostic catheter laboratory only (no stents, but can do catheters)
- Electrophysiology catheter laboratory with pacemakers and ICD (devices only, no ablations)
- Electrophysiology catheter laboratory with devices and also ablations
- An academic/training affiliated VA medical center with house staff managed inpatient cardiology service
- Employed cardiologists
- Contract cardiologists
- Advanced practitioner (NP or PA) support on inpatient cardiology service
- An inpatient advanced heart failure/transplant service
- Other comments (eg, have you identified things that would improve your inpatient cardiology experience)?

Abbreviations: CCU, cardiovascular care unit, critical care unit; ICD, implantable cardioverter-defibrillator; NP, nurse practitioner; PA, physician assistant; VA, US Department of Veterans Affairs.

cular medicine, Caroline Milne is a Professor and Vice Chair for Education and Program Director of the Internal Medicine Training Program, John Nord is an Assistant Professor of Medicine, and Paul Eleazer is a Professor of Medicine, all at the University of Utah School of Medicine in Salt Lake City, Utah.

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### Author disclosures

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### Disclaimer

The opinions expressed herein are those of the authors and do

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