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### Authors

Ikonomidis, John S

Ad, Niv

Aldea, Gabriel S

et al.

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## **Vascular Surgery Performed by Cardiothoracic Surgeons: Society of Thoracic Surgeons Survey**

John S. Ikonomidis, MD, PhD, Niv Ad, MD,<sup>1</sup> Gabriel S. Aldea, MD,<sup>2</sup> Michael Argenziano, MD,<sup>3</sup> Aubrey C. Galloway, MD,<sup>4</sup> Robert C. Hagberg, MD,<sup>5</sup> Robert L. Kormos, MD,<sup>6</sup> Jennifer S. Lawton, MD,<sup>7</sup> Tomislav Mihaljevic, MD,<sup>8</sup> T. Brett Reece, MD,<sup>9</sup> Elaine E. Tseng, MD.<sup>10</sup>

1. Fairfax Hospital, Department of Cardiovascular and Thoracic Surgery
2. University of Washington, Division of Cardiothoracic Surgery
3. Columbia University College of Physicians and Surgeons, Section of Adult Cardiac Surgery
4. New York University, Department of Cardiothoracic Surgery
5. Beth Israel Deaconess Medical Center, Adult Cardiac Surgery
6. University of Pittsburgh, Adult Cardiac Surgery
7. Washington University, Adult Cardiac Surgery
8. Cleveland Clinic Abu Dhabi, Adult Cardiac Surgery
9. University of Colorado, Cardiothoracic Surgery
10. University of California, San Francisco, Adult Cardiac Surgery.

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Address correspondence to:

John S. Ikonomidis, MD, PhD.  
Horace G. Smithy Professor and Chief,  
Division of Cardiothoracic Surgery,  
Medical University of South Carolina,  
BM 282  
114 Doughty Street  
Charleston, SC 29425  
(843) 876-4842 Office  
(843) 876-4866 Fax  
ikonomij@musc.edu

## **Abstract**

In January of 2013, a survey was conducted to assess the performance of vascular surgery by cardiac surgeons. The overall response rate was 8.7 %. 60% of surgeons practicing vascular surgery aged 45 to 64 years. 92% were male. 11% were board certified in vascular surgery. 61% of surgeons have been practicing 16 or more years. 33% were practicing in the southern United States. 22% of surgeons stated that at least 30% of their practice was devoted to vascular surgery. 81% respondents would like to see vascular surgery training become part of the formal curriculum for cardiothoracic surgery education and 90 % respondents that cardiothoracic surgery education should offer a cardiovascular track with emphasis on thoracic and vascular surgery, including endovascular surgery.

The past few years have seen a decline in volumes of certain cardiac surgical procedures such as CABG,<sup>1</sup> and as such some surgeons have supplemented their case volume by including or expanding their involvement in vascular surgery. In January of 2013, the Society of Thoracic Surgeons (STS) conducted a survey, soliciting the entire membership for conduct of vascular surgery procedures. The survey was sent out twice, once in a stand-alone-email on January 10, 2013 and then as a reminder in the periodical STS Weekly on January 15, 2013. The survey was sent out to 5271 members. The number of respondents was 461 and of those, 395 completed the entire survey. Therefore, the response rates were 8.7 % for all responders and 7.5 % for those who completed the entire survey.

## **Results**

### *Demographics*

31% (142/459) of surgeons were age 55 to 64 years of age, 29% (135/ 59) were age 45 to 54, 18% (81/459) were age 35 to 44, 16% (72/459) were age 65 or older, and 6% (29/459) were age 25 to 34 (**Figure 1**). 92% of responders were male. 44 % of responders (181/408) have been practicing for more than 20 years, 17% (71/408) were practicing 16 to 20 years, 16% (65/408) were practicing 11 to 15 years, 10% (41/408) have been practicing 0 to 5 years, 7% (28/408) were practicing 6 to 10 years and 6% were still in training (**Figure 2**).

42% (170/408) of responding surgeons said that 0 to 10 % of their practice was specifically devoted to vascular surgery, 16% (66/408) devoted 11 to 20 %, 13% (55/408) devoted 21 to 30 %, 8% (31/408) 31 to 40 %, 7% (30/408) devoted 41 to 50 % and 14 % (56/408) devoted greater than 50 % (**Figure 3**).

The vast majority of responders completed their training in the United States and are currently practicing in the United States. 33% (134/410) currently practice in the southern United States, 22% (89/410) practice in the mid-west United States, 18% (73/410) practice in the western United States, and 17% (68/410) practice in the north eastern United States, 10% (47/410) were practicing outside of

the United States (**Figure 4**).

44% (174/392) of respondents take vascular surgery call and 44 % (158/358 patients) stated that if given the opportunity, they would take vascular surgery call. 11% (41/388) of respondents were board certified in vascular surgery and 43 % (153/355) of respondents stated that they would like to be board certified in vascular surgery. 54 % (209/389) of respondents have participated in vascular CME activity in the past three years, and 60 % (234/388) plan to participate in the vascular CME activity within the next five years. 81% (312/385) respondents would like to see vascular surgery training become part of the formal curriculum for cardiothoracic surgery education and 90% (347/386) respondents that cardiothoracic surgery education should offer a cardiovascular track with emphasis on thoracic and vascular surgery, including endovascular surgery.

### *Procedures*

61% (249/406) regularly treat thoracic aortic aneurysms and of these, 92 % (240/261) performed open procedures and 61% (158/261) performed endovascular repair. 49% (196/400) regularly treated abdominal aortic aneurysms and of this group, 89 % (185/207) treated them open, and 76 % (158/207) treated them with endovascular repair. 39 % (159/396) performed thoraco-abdominal aneurysm repairs and 39% (155/399) performed other endovascular aortic procedures, 35% (141/395) treated thoracic outlet syndrome, 37 % (144/394) performed dialysis access or creation of arterial venous fistulas and 58% (227/391) participated in vascular trauma. 23% (91/390) performed amputations, 22% (87/392) performed inferior vena cava reconstructions, 32% (122/395) treated varicose veins, and 11% (46/ 392) treated lymphatic diseases.

50% (197/394) regularly treated peripheral vascular disease. In this regard, 97% (193/197) performed surgical bypass procedures, 46% (90/197) performed endovascular type procedures, and 85% (167/197) treated popliteal artery aneurysms. 50% (198/395) regularly treated aorta iliac disease and in this regard, 97% (197/203) treated these open, and 58% (118/203) treated these with endovascular techniques. 54% (225/394) regularly treated great vessel occlusive disease and of these, 97% (219/225)

used open techniques and 44 % (100/225) used endovascular techniques.

21% (83/388) respondents regularly treat mesenteric vascular disease including aneurysms and of these, 92% (76/83) respondents performed open procedures and 59% (49/83) respondents treated these endovascularly. 56% (219/387) regularly treated cerebrovascular disease and of these, 99% (218 of 219) respondents performed carotid endarterectomy, and 12 % (26 of 219) performed carotid stenting.

### *Discussion*

The above survey was undertaken to assess the performance of vascular surgery by cardiac surgeons. The results showed that surgeons of all stages of their careers have incorporated vascular surgical cases in their practice, and for 22% of surgeons taking the survey, this constitutes at least 30% of their case volume. Few surgeons (11% in this survey) were actually board certified on vascular surgery, but many more wished that they were, and the majority agree that formal vascular surgical training should be offered as part the educational options for cardiothoracic surgical residents.

The issue of formal vascular surgery training has become important more recently as hospitals have moved toward credentialing only those vascular surgeons with board certification. This has imposed significant challenges in situations where cardiac surgical groups that wish to renew their hospital credentials for vascular surgery, wish to bring a new member in their group and "bring them up to speed" in vascular surgery, or wish to introduce the performance of vascular surgery into their practice.

In a Society of Vascular Surgeons (SVS) practice survey conducted in February and March of 2011,<sup>2</sup> most vascular surgical practices have seen the proportion of endovascular and open procedures change to favor the former technique. While cardiac surgeons do a significant proportion of endovascular surgery, it seems from the current that most surgeons will perform open surgery more often than an endovascular procedure. A strong example of this is with carotid disease, where only 12%

of respondents in the present study offering carotid stenting. It is of interest that in the SVS survey, 20% of respondents felt that they were competing with cardiac surgeons for case volume.<sup>2</sup>

The issue of appropriate credentialing of surgeons for thoracic endovascular aortic repair (TEVAR) remains controversial. The consensus document published by the STS<sup>3</sup> lists significant experience with open thoracic aortic surgery as a key component of credentialing, whereas the SVS consensus document does not.<sup>4</sup> Currently, TEVAR can be performed by cardiac surgeons, vascular surgeons, interventional radiologists, and interventional cardiologists. Hospital credentialing appears to be awarded based on the need for the procedure and experience of the available practitioners in the catchment area.

This survey is limited by the low overall response rate of 8.7%, which could impact the true accuracy of the responses given when applied to the entire STS membership. Interestingly, only 220 of 2230 surgeons responded to the most recent SVS survey. Historically, response rates by the STS membership for the overall workforce surveys have ranged from 29% in 2014 (unpublished data) to 48% in 2010<sup>5</sup> and 63% in 2002.<sup>6</sup> It is therefore possible that a biased group of surgeons completed this survey.

Keeping the above in mind, this survey has provided expanded data on the performance and breadth of practice of vascular surgery by the STS membership. Further longitudinal surveys of this nature would be beneficial to help tailor education and training of our young surgeons and expand discussions providing justification of the continued provision of vascular surgery credentialing for cardiac surgeons.

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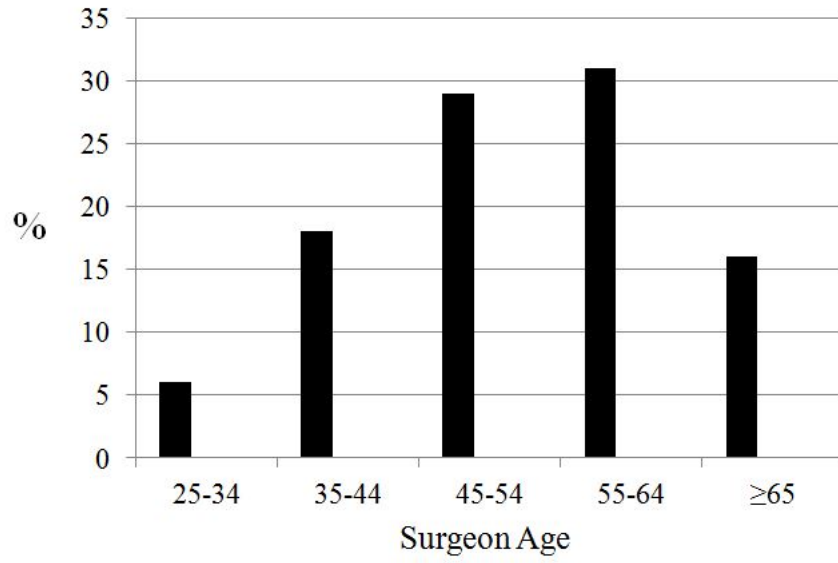
*Figure Legends*

**Figure 1. Performance of vascular surgery by cardiac surgeons: surgeon age.**

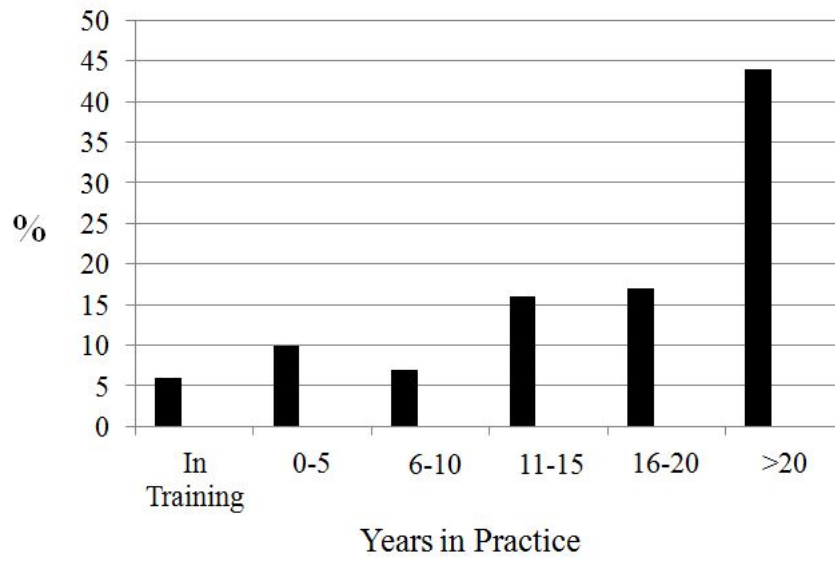
**Figure 2. Performance of vascular surgery by cardiac surgeons: number of years in practice.**

**Figure 3. Performance of vascular surgery by cardiac surgeons: percentage of practice.**

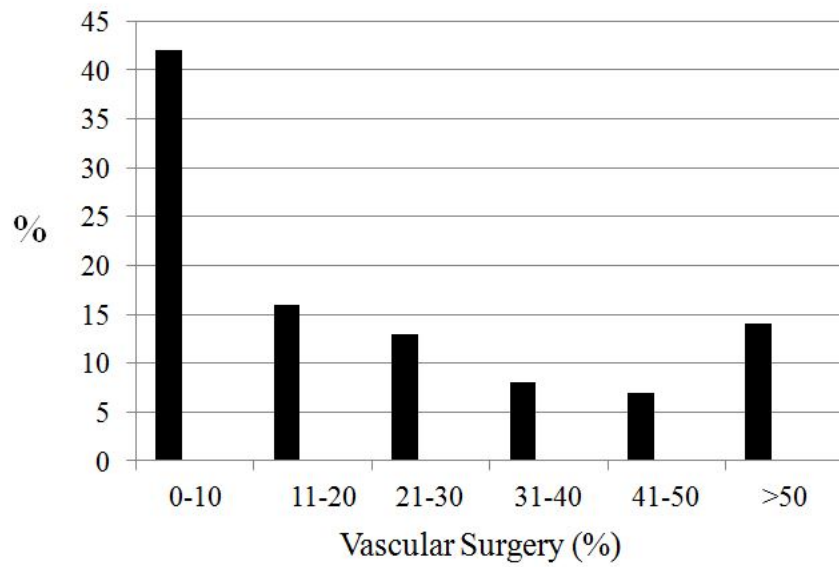
**Figure 4. Performance of vascular surgery by cardiac surgeons: regional distribution.**



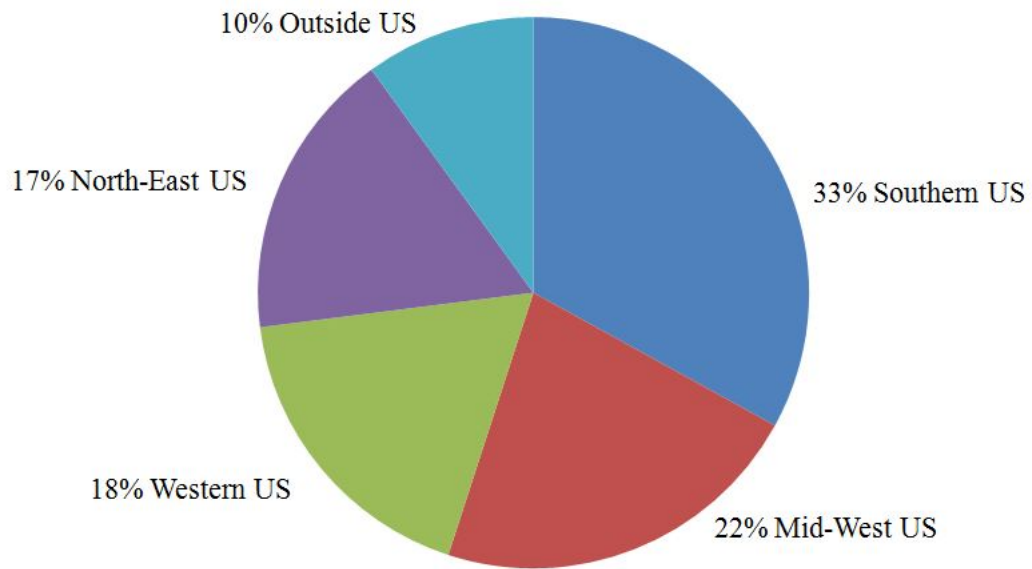
**Figure 1. Performance of vascular surgery by cardiac surgeons: surgeon age.**



**Figure 2. Performance of vascular surgery by cardiac surgeons: number of years in practice.**



**Figure 3. Performance of vascular surgery by cardiac surgeons: percentage of practice.**



**Figure 4. Performance of vascular surgery by cardiac surgeons: regional distribution.**