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Variability and Outcomes of Medical and Lifestyle Management of Peripheral Arterial Disease at the Time of Lower Extremity Bypass

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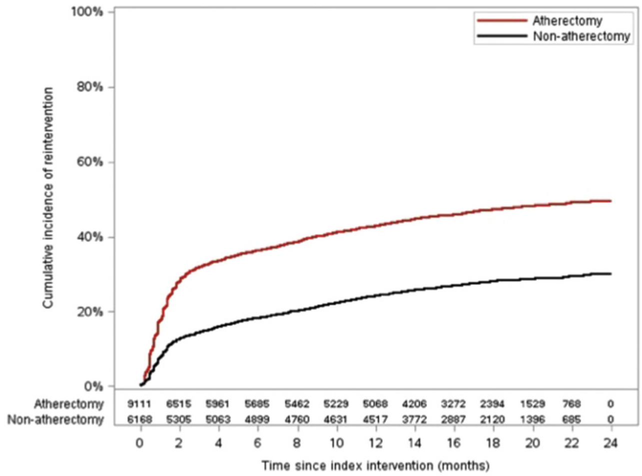

Fig 1. Kaplan-Meier curves showing peripheral vascular intervention (PVI) reinterventions for patients who underwent index fcmoropoplitcal atherectomy versus nonatherectomy for the treatment of claudication.

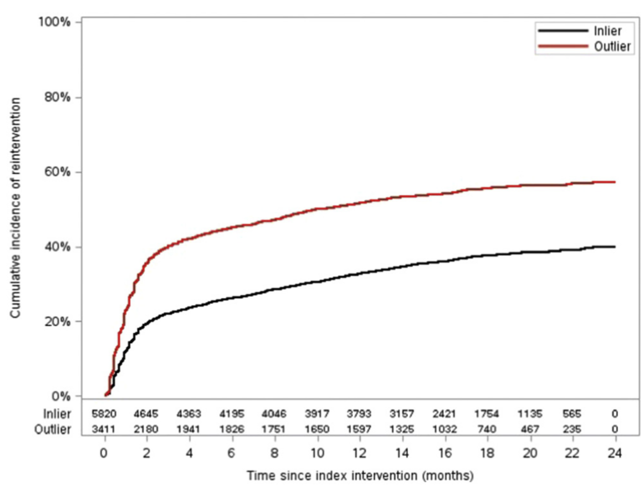

Fig 2. Kaplan-Meier curves showing peripheral vascular intervention (PVI) reinterventions for patients who underwent index femoropopliteal PVI by an inlier (quartile 1-3) versus outlier (quartile 4) physician.

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SAVS4.

Variability and Outcomes of Medical and Lifestyle Management of Peripheral Arterial Disease at the Time of Lower Extremity Bypass

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Background: First-line treatment of peripheral arterial disease (PAD) involves medical therapy and lifestyle modification. Specifically, the 2016 American Heart Association/American College of Cardiology guidelines for the management of PAD make Class I recommendations for antiplatelet therapy, statin therapy, antihypertensive therapy, and cilostazol therapy, as well as exercise therapy and smoking cessation. Although evidence supports medical and lifestyle management of PAD before surgical intervention, it is currently unclear whether clinical practice reflects this. Moreover, it is also unknown whether variability in medical and lifestyle optimization before revascularization affects short- and long-term outcomes. This study was conducted to determine the proportion of patients actively receiving evidence-based medical and lifestyle therapy at the time of surgery in a regional hospital network and whether receipt of therapy affected outcomes.

Methods: We conducted a retrospective study of adult patients undergoing elective open lower extremity bypass for claudication, rest pain, or tissue loss from 2012 to 2021 within a large, statewide, 35 hospital quality registry. The primary exposures were preoperative medical therapy (specifically antiplatelet agents, statins, angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, and cilostazol) and lifestyle management including supervised exercise therapy and participation in smoking cessation counseling. The primary outcomes were 30-day and 1-year mortality, hospital readmission, amputation, wound complications, myocardial infarction, nonpatent bypass, and nonambulatory functional status. Multivariable logistic regression was performed to estimate the association of receiving some or all recommended therapy on outcomes.

Results: There were 10,278 patients who underwent bypass surgery during the study period, with a mean age of 65.8 ± 10.4 years; 7036 patients (68.5%) were male. The prevalence of medical and lifestyle management at the time of surgery was variable (Figure). Of the original cohort, 30-day follow-up data were available for 9664 patients (94.0% follow-up rate) and 1-year follow-up data were available for 7341 patients (71.4% 1-year follow-up rate). Among patients on relevant medications at discharge, at 30 days, 96.8% were still taking antiplatelet agents, 96.7% were still taking statins, 86.5% were still taking angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers, and 24.7% of patients who received smoking cessation therapy had quit smoking. Compared with patients on no therapy, patients on some therapy had significantly lower odds of amputation at 30 days (adjusted odds ratio [aOR], 0.61; 95% confidence interval [CI], 0.38-1.00). At 1 year, there was no significant association between being on some or all therapy and any outcomes; however, similar trends were observed for amputation (some therapy: aOR, 0.64 [95% CI, 0.39-1.04]; all therapy: aOR, 0.48 [95% CI, 0.22-1.04]).

Conclusions: Although medical and lifestyle management are recommended as first-line treatments for patients with PAD, preoperative adherence to these recommendations was highly variable. Patients actively receiving preoperative treatment seem to have a lower risk of subsequent amputation after surgery. This suggests that not only are there significant opportunities to improve adherence to evidence-based treatment of PAD, but that doing so may benefit patients postoperatively.

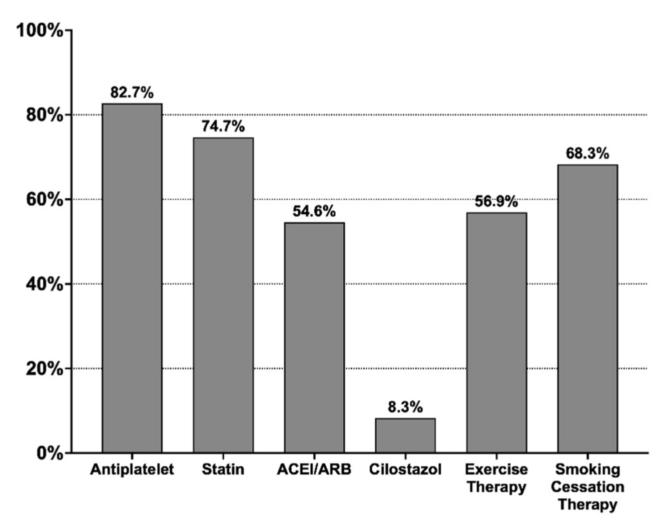

Fig. Prevalence of smoking cessation therapy calculated among 4916 current smokers.

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SAVS5.

Mortality Differences in Complex Endovascular Repair of Thoracoabdominal Aneurysms in the VQI and Aortic Research Consortium

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Background: In the setting of increasing "off-label" use of aortic devices, such as physician-modified devices, recent Vascular Quality Initiative (VQI) studies demonstrate high mortality following endovascular repair of TAAA, with increased mortality in patients with more extensive disease. US Food and Drug Administration-approved investigational device exemption (IDE) studies, performed at 10 high-volume aortic centers within the US Aortic Research Consortium (ARC), allow controlled implementation of investigational technologies for treatment of complex TAAA using purpose-built devices. The aim of this study is to compare outcomes of IDE patients compared with patients within the VQI registry.

Methods: A retrospective review was conducted with the VQI registry (containing no IDE devices) and the ARC registry of all patients who underwent elective complex endovascular treatment of asymptomatic nontraumatic aneurysmal disease involving the visceral aorta between 2011 and 2019. The extent of aneurysmal disease was categorized using standard Crawford extent definitions based on graft deployment zones. Mortality was evaluated with Kaplan-Meier survival analysis.

Results: A total of 3212 patients were evaluated; 51% were from the ARC database and 49% were from the VQI registry. Table I demonstrates the extent of disease between the VQI and ARC. Compared with the VQI, the ARC cohort had significantly higher proportion of extent 2 and extent 4 aneurysms. Baseline maximal aneurysm diameters did not vary significantly by extent of aneurysm between the cohorts. compared with the VQI, male gender, coronary artery disease, and chronic obstructive pulmonary disease were more prevalent within the ARC cohort, whereas end-stage renal disease was less prevalent within the ARC cohort. Mortality at 30 days across all extents was significantly higher in the VQI compared with ARC (6.7% vs 2.2%; $P < .001$). Similarly, 1-year mortality was significantly higher in the VQI cohort compared with the ARC cohort (14.3% vs 10.2%; $P < .001$) (Table II). Mortality within aneurysms isolated below the diaphragm (extent 4) was significantly higher within the VQI compared with ARC at both 30 days (6.1% VQI vs 2% ARC; $P < .001$) and 1 year (12.3% VQI vs 8.4% ARC; $P = .005$). Similarly, mortality in aneurysms involving the thoracic aorta (extent: 1, 2, 3, and 5) was significantly higher in the VQI compared with ARC at both 30 days (7.3% VQI vs 2.6% ARC; $P < .001$) and 1 year (16.3% vs 13.1%; $P = .035$).

Conclusions: Across both the ARC and VQI cohorts, patients with more extensive aortic disease treated with endovascular approaches have poorer survival. Compared with the VQI, patients in the ARC database have improved survival after repair, regardless of disease extent despite an older patient population, and similar comorbidity profile. These differences may be due to the highly selective nature of IDE studies within the ARC, improved outcomes in high-volume centers with dedicated aortic teams and a focus on complex aortic disease, and/or an unmeasured benefit of custom aortic devices and repair techniques.

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Table I. Baseline anatomic and procedural details between the Aortic Research Consortium (*ARC*) and Vascular Quality Initiative (*VQI*) cohorts

	All (n = 3212)	VQI Cohort (n = 1571)	ARC Cohort (n = 1641)	*P* value
Aneurysm extent				<.001
Type 1	219 (6.8)	172 (10.9)	47 (2.9)	
Type 2	532 (16.6)	229 (14.6)	303 (18.5)	
Type 3	482 (15.0)	238 (15.1)	244 (14.9)	
Type 4	1827 (56.9)	802 (51.1)	1025 (62.5)	
Type 5	152 (4.7)	130 (8.3)	22 (1.3)	
Maximal aneurysm diameter (mm)				
Type 1	63.6 ± 10.9	63.9 ± 13.9	64.5 ± 11.3	.442
Type 2	64.2 ± 10.9	65.8 ± 11.9	63.9 ± 10.1	.055
Type 3	64.7 ± 10.1	64.0 ± 9.7	65.4 ± 10.9	.137
Type 4	62.8 ± 10.6	62.3 ± 10.2	63.8 ± 11.4	.112
Type 5	62.5 ± 10.1	62.0 ± 9.8	64.5 ± 7.3	.575
Demographics				
Age		72.3 ± 8.9	73.4 ± 7.9	<.001
Male gender	2197 (68.4)	1027 (65.4)	1170 (71.3)	<.001
Caucasian race	2736 (85.3)	1267 (80.6)	1469 (89.8)	<.001
HTN	2930 (91.3)	1438 (91.5)	1492 (90.9)	.394
CAD	1188 (37.0)	442 (28.1)	746 (45.5)	<.001
CHF	430 (13.4)	223 (14.2)	207 (12.6)	.195
COPD	1211 (32.7)	660 (20.3)	551 (17.2)	<.001
ESRD	77 (2.4)	53 (3.4)	24 (1.5)	<.001
History of smoking	2807 (87.6)	1377 (87.7)	1430 (87.6)	.944

BMI, Body mass index; *CAD*, coronary artery disease; *CHF*, congestive heart failure; *COPD*, chronic obstructive pulmonary disease; *ESRD*, end-stage renal disease; *HTN*, hypertension.
Values are number (%) or mean ± standard deviation.