

**Objective(s):** Diversity among health care providers is felt to be an important component in addressing health care disparities and may help improve patient communication. Caucasian men have historically represented vascular surgery (VS). We hypothesized that the 5-year integrated VS residency paradigm might foster increased diversity.

**Table.** Applicants in vascular surgery training

	% Independent (5+2)						% Integrated (0+5)									
	Year	Female	Cauc	Black	Asian	Am	Nat	No	Female	Cauc	Black	Asian	Nat	No	Other	resp
2007	15.8	54.2	5.2	25.2	0.0	4.5	11.0	0	83.3	0.0	0.0	0.0	16.7	0.0		
2008	18.3	60.0	6.9	23.1	0.8	2.3	6.9	16.1	41.2	5.3	28.1	0.0	13.2	12.3		
2009	19.5	63.7	4.8	15.3	0.0	4.0	12.1	22.1	39.6	5.8	24.0	0.0	11.0	19.5		
2010	26.3	53.8	6.7	23.5	0.0	3.4	12.6	20.3	38.9	9.7	28.3	0.9	8.3	14.0		
2011	27.1	53.5	3.1	29.4	0.7	4.6	11.6	22.9	54.1	1.9	18.5	0.6	8.2	26.1		

	First year residents in integrated vascular residency			First year fellows in vascular surgery		
	# Female	# Male	% Female in PGT 1 year	# Female	# Male	% Female in first year fellowship
2007	0	6	0%	15	104	13%
2008	3	11	21%	16	99	14%
2009	5	17	23%	18	99	15%
2010	9	18	33%	14	109	13%
2011	17	12	59%	20	94	18%

**Methods:** Applicant sex and race status listed on the Electronic Resident Application System (ERAS) from 2007 to 2011 was evaluated on all applications to integrated (5-year) VS residencies and fellowships (2 year). Sex data were available for all of VS Accredited Council for Graduate Medical Education (ACGME) integrated residencies and fellowships. VS training programs were also reviewed to determine diversity of program directors and faculty.

**Results:** Female applicants to VS integrated programs increased >20-fold during the 5-year study period, from 0 (0%) in 2007 to 69 (22.9%) in 2011, compared with a 1.7-fold increase in fellowship applicants. African American applicants to integrated programs during the study period ranged from 0% to 9.7% and Asian applicants from 0% to 28.3% (Table). There were no women (0%) in the 2007 integrated intern class and 17 (59%) in the 2011 postgraduate year 1 class, compared with 15 (13%) and 20 (18%), respectively, in the fellowships. Of 32 integrated VS programs in 2010, three (9.4%) program directors were women, one (3.1%) was Asian, and 22 (68.7%) were Caucasian men. Of the 101 VS fellowship program directors, seven (6.9%) were women, six (5.9%) were Asian, and 74 (73.2%) were Caucasian men. One or more female VSs were on staff at 20 (62.5%) of the VS divisions that had integrated training programs.

**Conclusions:** Redesigning training in VS appears to appeal to women, with less effect on race. There remains room to increase diversity among trainees, program directors, and faculty in VS training programs.

#### BRAVISSIMO: 12-Month Results From a Large-Scale Prospective Trial

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##### Sponsored by Rabih A. Chaer, MD

**Objective(s):** The Belgian-Italian Trial Investigating Abbott Vascular Iliac Stents in the Treatment of TASC A, B, C and D Iliac Lesions (BRAVISSIMO) study is a prospective, nonrandomized, multicenter trial, conducted at 12 Belgian hospitals and 11 Italian hospitals. The objective is to evaluate the long-term (24-month) outcome of the self-expanding nitinol Absolute Pro (Abbott Vascular) and the balloon-expandable Omniflex Elite (Abbott Vascular) stent in TransAtlantic InterSociety Consensus (TASC) A and B and TASC C and D iliac lesions. A separate analysis of both patient populations is performed.

**Methods:** Primary study end point is primary patency at 12 months, defined as a target lesion without a hemodynamically significant stenosis (>50%, systolic velocity ratio <2.0) on duplex ultrasound imaging and without target lesion revascularization (TLR) ≤12 months. The study included 325 patients, of which 190 presented with TASC A or B lesions and 135 with TASC C or D lesions. Analysis is performed comparing the results of the TASC A/B cohort with the results of the TASC C/D cohort.

**Results:** The study included 131 patients with TASC A, 59 with TASC B, 54 with TASC C, and 82 with TASC D aortoiliac lesions. Demographic data were comparable for all TASC patient groups. Of the TASC A patients,

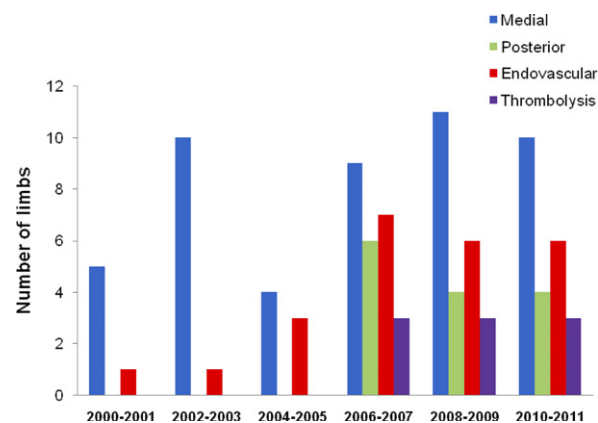
85 received Omniflex Elite stents, 45 received Absolute Pro stents, and one received both stents. Of the TASC B patients, 24 received Omniflex Elite stents, 24 received Absolute Pro stents, and mixed stent use was reported in two patients. In the TASC C group, 14 patients were treated with Omniflex Elite, 34 with Absolute Pro, and six with both stents. Of the TASC D patients, 29 received the Omniflex Elite, 35 received the Absolute Pro, and 18 received both. The 12-month primary patency rates were uniformly high, without statistically significant differences among TASC groups: A, 94%; B, 96%; C, 91%; and D, 88%. Stratified by stent use, 12-month primary patency rates were 96% for self-expanding stents, 90% for balloon-expandable stents, and 84% for the 27 patients treated with both types ( $P = .03$ ).

**Conclusion:** Primary endovascular treatment of symptomatic iliac artery occlusive disease produces 12-month patency ≥88% irrespective of TASC classification. On the basis of these findings, endovascular therapy should be considered the treatment of choice for this condition; primary aortofemoral bypass is no longer indicated for isolated iliac artery occlusive disease.

#### Evolving Treatment of Popliteal Artery Aneurysm

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**Objective(s):** During the past decade, the treatment of popliteal aneurysms has evolved at our institution from the sole operative intervention during the initial part of the study period, to combined surgical and endovascular treatment, and finally, to endovascular-centered management in more recent years. Outcomes among treatment modalities for popliteal aneurysms were assessed.



**Fig.**

**Methods:** This is a retrospective review of all patients with popliteal aneurysms treated at our institution from 2001 to 2011. Data collection included the indication for intervention, treatment details, interventional patency, limb salvage, perioperative outcome, and long-term survival.

**Results:** During this period, 88 aneurysms were treated in 72 patients. Indications for intervention included 47 (53%) with symptomatic presentations, and 41 (47%) were asymptomatic. Treatment included endovascular exclusion in 24, surgical repair in 63 (14 posterior approach and 49 medial approach with bypass and exclusion), and primary amputation in one patient. Nine aneurysms (10.2%) received catheter-directed thrombolysis (Fig). Demographics were similar between the two treatment cohorts, except for age, with endovascular stenting patients significantly older (76.0 vs 66.0 years,  $P = .002$ ). The mean length of stay was 3.9 vs 9.5 days ( $P < .001$ ), favoring endovascular treatment. There were no perioperative (30-day) deaths in the endovascular group and one death in the surgical cohort. The mean patency follow-up was 18.5 vs 28.3 months. Primary patency did not differ between endovascular and surgically treated patients at 1 year (92.3% vs 83.3%,  $P = .26$ ) and 3 years (61.5% vs 77.8%,  $P = .89$ ). No limbs were lost in the endovascular group during the follow-up period of 22.4 months. One late limb loss occurred in the surgical cohort (mean follow-up, 29.2 months). The long-term survival rate was 65% in the endovascular patients (mean follow up, 33.9 months) and 80.8% in the surgical patients (mean follow up, 42.9 months,  $P = .22$ ).

**Conclusions:** Endovascular treatment of popliteal aneurysms provides similar short-term patency to that of the traditional gold standard approach

with surgical bypass, with shorter hospitalizations in symptomatic and asymptomatic patients. Further long-term follow-up is required to compare these two treatment modalities for durability to determine the optimal popliteal aneurysm management.

**Multifactorial Disease Severity Score (DSS) Predicting the Success of Endovascular Intervention of Femoropopliteal Peripheral Arterial Disease**

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**Objective(s):** The goal was to create a multifactorial Disease Severity Score (DSS) for characterization of femoropopliteal arterial lesions. By having a greater understanding of the effect of patient comorbidities and an in-depth method to characterize an arterial lesion, we may be able to better compare lesions in different studies and predict which therapy is most appropriate for each lesion undergoing an endovascular intervention (EVI).

**Methods:** We evaluated 44 lesion and patient characteristics in our prospectively maintained lower extremity arterial lesion database from 2005 to 2009 to create a graded DSS.

**Results:** We identified 1329 femoropopliteal lesions in 675 patients. Statistical analysis by multivariable Cox proportional hazards model identified 16 variables that impact patency: seven lesion characteristics (Table I) and nine patient characteristics or comorbidities (Table II). Factors with the most impact were a chronic total occlusion (DSS 16), lesion length >100 mm (DSS 13), and no runoff vessels and stenosis of 80% to 99% (DSS 9). The following factors were considered baseline, or score of 0: stenosis <80%, lesion length <100 mm, and three-vessel runoff. By adding these variable scores, a DSS was created and used to predict patency of the EVI.

**Conclusions:** The presence of a chronic total occlusion, lesion length >100 mm, poor runoff, and the presence of congestive heart failure have the most dramatic effect on patency after EVI. A comprehensive DSS allows for the in-depth classification of lesion characteristics and factors that predict success of EVI and can allow for comparison of distinct lesions. Future comparisons of effectiveness of treatment modalities can be possible.

**Table I.** Significant femoropopliteal lesion characteristics that negatively impact patency after endovascular intervention

Factor	Score	HR (95% CI)
Chronic total occlusion	16	1.73 (1.28-2.33)
Stenosis 80%-90%	9	1.38 (1.06-1.78)
Lesion length ≥100 mm	13	1.55 (1.25-1.93)
Vessel runoff <sup>†</sup>		
0	9	1.36 (0.95-1.96)
1	7	1.29 (0.96-1.73)
2	1	1.04 (0.77-1.40)
Lesion calcification	1	1.04 (0.82-1.31)

CI, Confidence interval; HR, hazard ratio.

**Table II.** Patient characteristics that impact patency after endovascular intervention

Factor (N = 16)	Score	Cox coefficient	HR (95% CI)
CHF	8	0.274	1.32 (0.99-1.74)
Female sex	7	0.227	1.25 (0.96-1.63)
Current smoker	7	0.234	1.26 (0.80-1.99)
Former smoker	3	0.121	1.13 (0.85-1.50)
Diabetes	6	0.199	1.22 (0.94-1.58)
CAD	4	0.147	1.16 (0.88-1.53)
Renal	4	0.140	1.15 (0.85-1.55)
Age, years			
50-64	6	0.195	1.22 (0.84-1.76)
65-79	-2	-0.075	0.93 (0.69-1.25)

CAD, Coronary artery disease; CHF, congestive heart failure; CI, confidence interval; HR, hazard ratio.

**Defining the Role of Endovascular Therapy in Critical Limb Ischemia With Tissue Loss**

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**Objective(s):** We compare the utility of endovascular therapy (ET) with bypass surgery for critical limb ischemia (CLI) with tissue loss and identify risk factors for failure of ET.

**Table.**

	Hazard ratio (HR/AOR)	95% CI for HR/AOR	P value
Overall survival			
Dialysis dependence	3.0	1.1-8.1	.03
Angina	5.1	1.3-20.3	.02
COPD	3.8	1.8-8.3	.001
Amputation free survival			
Rutherford 6	3.6	1.4-9.2	.007
COPD	3.6	1.3-9.6	.01
Limb salvage			
Rutherford 6	35.1	5.4-231	<.0001
Wound healing at 12 months			
Diabetes	7.0	1.4-36	.02
Current smoking	5.3	1.1-26	.04
Patency loss	4.8	1.1-22	.04

**Methods:** A retrospective review (2004 to 2010) of patients undergoing ET for tissue loss (Rutherford class 5 and 6) provided data for multivariate models of overall survival, amputation-free survival (AFS), limb salvage, and wound healing. Comparisons were made with a bypass surgery cohort matched for tissue loss.

**Results:** Ninety-four patients underwent ET (58% TransAtlantic InterSociety Consensus [TASC] C/D; 44% tibial) for Rutherford 5 (88%) or Rutherford 6 (12%) CLI with tissue loss of the heel (15%), forefoot (16%), toe(s) (43%), calf/ankle (11%), or multiple locations (15%). Sustained limb salvage was 83% ± 5%. Overall survival was 44% ± 7% and AFS was 40% ± 7% at 2 years. Predictors of failure by multivariate models are reported in the Table. Comparison between the Rutherford 5 WR subgroup (n = 83) and an Rutherford 5 bypass cohort (n = 66), suggest equivalent limb salvage, with reduced AFS (P = .04) and a trend toward reduced overall survival (P = .09). Early wound healing was higher after bypass: 43% vs 11% at 3 months (P = .001) and 57% vs 30% at 6 months (P = .01).

**Conclusions:** Given the short life expectancy of patients with tissue loss, ET permits sustained limb salvage in patients at high risk for bypass (particularly Rutherford 5). However, wound healing is slow compared with bypass and requires sustained patency.

**Midterm Results of Limb Salvage and Stent Patency with Popliteal Artery Stenting Across the Knee Joint**

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**Objective(s):** This study evaluated the relationship of stent location on limb salvage and stent patency in patients undergoing popliteal artery stenting.

**Methods:** We performed a retrospective review of a prospectively collected database, identifying all patients undergoing popliteal artery stenting between September 2009 and February 2012. Patients were divided into two groups based on the position of the distal end of the stent in relation to the knee joint. The proximal popliteal stent group included patients receiving a stent ending above the patella (above the flexion point of the knee). The distal popliteal stent group included patients receiving a stent(s) ending below the patella (in the flexion zone). Data collected included demographics, indication for surgery,