rent critical limb ischemia, loss of secondary patency, and major amputation in those with primary occlusion were 55%, 79%, and 22%, respectively, compared with 18%, 10%, and 10% for the remaining cohort (*P* < .001). On univariate analysis (hazard ratio [HR] [95% confidence interval]), African American race (1.4 [1.01-1.9]), use of anticoagulants (1.54 [1.2-2]), use of alternative/spliced vein conduit (1.44 [1.1-1.97]) and graft diameter <3 mm (1.97 [1.2-3.3]) were associated with increased risk of primary occlusion. On multivariate analysis (HR [95% confidence interval]) graft diameter <3 mm (1.8 [1.1-3]) and use of anticoagulants (1.4 [1.04-1.89]) were independent predictors. In 110 individuals, DUS had revealed no critical threshold abnormalities prior to the thrombosis. On multivariate analysis, graft diameter <3 mm (2.3 [1.2-4.7]) was the sole independent predictor of these unheralded occlusions.

Conclusions: Approximately one-third of primary vein graft events are occlusions even in the setting of DUS surveillance. Smaller diameter grafts are at increased risk. These findings suggest that prevention of vein graft thrombosis requires further improvements in risk stratification, surveillance, and antithrombotic therapies.

Outcomes of Percutaneous Lower Extremity Procedures Depend More on Indication Than Physician Specialty

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Objectives: Outcomes of percutaneous lower extremity procedures (PLEP) have been recently linked to physician specialty. Unfortunately, the indication for intervention was not reported. We sought to compare outcomes between specialties performing PLEP for different indications in a recent statewide inpatient discharge data set.

Methods: The Florida hospital discharge data from 2005 to 2009 was reviewed for patients with PLEP during hospitalization. We assigned physician specialty as interventional radiology (IR), interventional cardiology (IC), or vascular surgery (VS) based on physician-associated procedures. Clinical indication was claudication or critical limb ischemia (CLI). We limited our analysis to patients without concomitant open surgery during hospitalization. We compared mortality, length of stay (LOS), major use of intensive care unit (ICU), discharge disposition, and total charges between specialties with logistic regression models, both unadjusted and adjusted for demographic and clinical characteristics.

Results: A total of 15,398 patients (47% with CLI) had a PLEP. IC performed the majority of procedures on claudicant patients (VS 30%, IC 57%, IR 13%), and VS performed the majority of procedures on CLI patients (VS 50%, IC 22%, IR 27%). VS and IR were more likely than IC to treat CLI patients (VS 59%, IR 65%, IC 26%; *P* < .001). Among CLI patients, there was no difference in mortality rates between the three specialties in unadjusted analysis (VS 2.3%, IR 3.0%, IC 2.1%, *P* = .124), nor after adjustment (odds ratio [OR] VS, reference; IR, 1.05; IC, 0.82; *P* = NS for both). However, compared with VS, IR-treated patients were less likely to be discharged home (OR, 0.73; *P* < .001), LOS was longer (β, 1.15 days; *P* < .001), major ICU use was more common (OR, 1.48; *P* < .001), and total charges were higher (β, $3267; *P* = .001). CLI was most predictive for death (OR, 4.02; *P* < .001), major ICU use (OR, 1.95; *P* < .001), discharge home (OR, 0.50; *P* < .001), increased LOS (β, 3.25 days; *P* < .001), and total charges (β, $18,364; *P* < .001).

Conclusions: VS treat the majority of CLI patients, while IC treat mostly claudicant patients. Although physician specialty does impact several clinical outcomes, the clinical indication for PLEP is the strongest predictor of adverse outcomes. Future outcome analyses of PLEP should adjust for clinical indication.

The Growing Burden of Restenosis in Peripheral Arterial Disease and Its Impact on Outcomes

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Objectives: Primary peripheral vascular interventions (PVI) and surgical bypass often suffer from restenosis, and secondary procedures performed following restenosis may have poorer outcomes. We investigated how commonly lower extremity bypass (LEB) is performed in the setting of a prior PVI or surgical bypass ("secondary LEB"), and how the outcomes of secondary LEB compare to primary LEB.

Methods: Within the Vascular Surgery Group of New England (VSGNE), we studied 3,504 patients who underwent LEB (2003-2011). We compared utilization, indications, and outcomes between patients who had primary versus secondary LEB. In-hospital outcomes and outcomes at 1-year follow-up were analyzed and inverse propensity weighting was performed to adjust for differences between the two groups. Subgroup analyses were performed to determine the influence of indication (claudication/critical limb ischemia [CLI]) and prior intervention type (PVI/LEB/both) on outcomes for secondary LEB.

Results: Overall, we studied 2350 patients undergoing primary LEB, and 1154 secondary LEB patients who underwent LEB in the setting of a prior PVI (48%), a prior bypass (37%), or both (14%). Of all patients who underwent LEB, the proportion of patients undergoing secondary LEB has doubled over the last 9 years (22% in 2003, 38% in 2011; *P* < .001). This increase was evident in treatment of patients with CLI (18% to 28% of all LEB; *P* < .001) and claudication (4% to 10% of all LEB; *P* < .001) (Fig). In crude analyses, rates of in-hospital myocardial infarction (4%), death (2%), or amputation (0.5%) were similar between patients undergoing primary and secondary LEB. However, secondary LEB patients had significantly worse overall freedom from death, reintervention or above-ankle amputation (RAO; 58.9% vs 64.1%; *P* < .001), and worse freedom from death or major adverse limb event (MALE; 61.6% vs 67.5%; *P* < 0.001) at 1-year follow-up. These results persisted, even when using inverse propensity weighting to account for differences in patients characteristics. On subgroup analysis, inferior RAO-free survival and MALE-free survival in patients undergoing secondary LEB was independent of the type of prior revascularization (PVI, LEB, or both).

Conclusions: The proportion of patients who undergo LEB as a secondary procedure has increased significantly in recent years in patients with both claudication and CLI and their associated outcomes are worse. In an era where many advocate an endovascular-first approach to all patients with lower extremity PAD, physicians should consider the first intervention carefully, not only because of the potential immediate implications, but also because of the implications of treatment failure on future events.

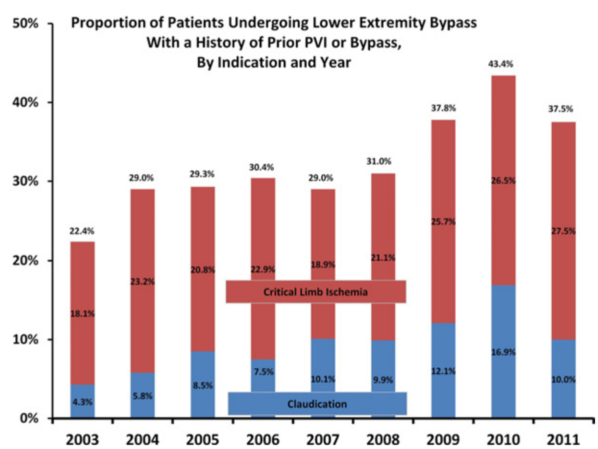

Fig.

Hospital Reimbursement for Carotid Stenting and Carotid Endarterectomy

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Objectives: We previously demonstrated that carotid artery stenting (CAS) had a 40% greater cost than carotid endarterectomy (CEA) and did not provide superior outcome or a reduction in length of stay. However, Medicare hospital reimbursement for CAS (DRGs 34, 35, 36) is 12% to 61% greater than that for CEA (DRGs 37, 38, 39). Hospital reimbursement for these procedures has not been previously examined.

Methods: A retrospective review of the hospital reimbursement and cost for CAS and CEA was performed over a 33-month period at a tertiary care institution. This financial data was calculated through the institution's Eclipsys cost accounting system, which captures hospital reimbursement as well as direct, variable, and fixed costs. Physician professional fees and reimbursements were excluded. Data are presented as mean ± standard deviation.

Results: A total of 306 patients underwent CAS (n = 132) or CEA (n = 174). Hospital reimbursement was 18% higher for CAS ($12,000 ± $5634) vs CEA ($10,160 ± $4687; *P* < .01). However, because of the significantly higher materials' costs of CAS, the net revenue (income) for the hospital was 33% greater in patients undergoing CEA ($3426) than CAS ($2574) These differences in hospital reimbursement and net income were consistent in asymptomatic (n = 183), symptomatic (n = 123), and urgent (n = 36) subgroups (see Fig). Asymptomatic patients