Objective(s): Restenosis following carotid endarterectomy (CEA) is clinically challenging. Level I Evidence have shown reduction in restenosis rates with patch closure during CEA. In 2010, the Vascular Study Group of New England (VSGNE), a regional quality-improvement initiative, reported an increase in the use of patching between 2003 and 2008 in the NE region which was associated with a slight decrease in clinically significant restenosis at <1 year after conventional CEA. The present study reflects on more recent practice patterns and identifies predictors of CEA restenosis using a large national database.

Methods: Patients undergoing primary CEA in the VQI dataset (2003-2017) were analyzed. Significant restenosis was defined as 70% or more diameter-reducing stenosis, target-artery occlusion or peak systolic velocity ≥300 cm/sec, or as repeat revascularization. Kaplan-Meier survival analysis and bootstrapped cox regression models with stepwise forward and backward selection were utilized.

Results: A total of 37,650 CEAs performed on 35,354 patients were analyzed. Median follow up was 391 days (IQR: 315-467). Kaplan-Meier estimates for the frequency of restenosis were 2.3% within 1 year and 4.0% within 2 years. There was an increase in patch use over time, especially between 2004 and 2009, which was associated with a slight decrease in major restenosis. Patients who had restenosis were slightly younger [median (IQR), 70 (64-76) vs. 71 (64-77) years], more likely to be females (48.1% vs. 38.7%), White (95.2% vs. 93.7%), on statins (82.3% vs. 79.8%), and to have had prior vascular procedures such as bypass (7.9% vs. 6.1%), and contralateral CEA or CAS (22.0% vs. 18.7%) (All p<0.05). Of all patients who had restenosis on follow-up (n=1,513), 5.3% were symptomatic and 25.6% underwent revascularization. Patch use was associated with longer restenosis-free survival (HR: 0.74, 95% CI: 0.59-0.90). Other significant predictors of restenosis included age, female gender, White Race, Hispanic/Latin Ethnicity, prior lower extremity bypass and prior contralateral carotid revascularization (Figure).

Conclusions: The major decrease in restenosis rates between 2004 and 2009 reflects the change of practice patterns due to quality-improvement initiatives and feedback on the benefits of patching during that time period. Our findings re-emphasize the importance of patch use particularly in patients with the high-risk factors identified in this study. Further quality improvement projects and studies with longer follow up are needed to compare rates, identify risk factors and outcomes of restenosis between CEA and CAS.