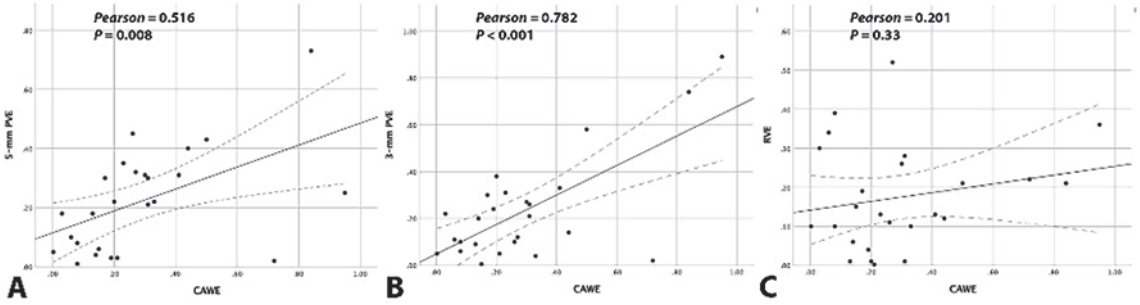

Abstract O-021 Figure 2

enhancement on high-resolution vessel wall imaging (HR-VWI) is a marker of wall inflammation and instability. We aim to determine if there is any association between increased contrast enhancement in the aneurysmal wall and its parent artery using 7T HR-VWI.

Methods Patients with unruptured intracranial aneurysms (UIAs) underwent 7T HR-VWI. Regions of interest were selected manually and with a semi-automated protocol based on gradient algorithms of intensity patterns. Mean signal intensities in pre- and post-contrast T1-weighted sequences were adjusted to the enhancement of the pituitary stalk and then subtracted to objectively determine: 1) circumferential aneurysmal wall enhancement (CAWE), 2) parent vessel enhancement (PVE), and 3) reference vessel enhancement (RVE). PVE was assessed over regions located 3- and 5-mm from the aneurysm's neck. RVE was assessed in arteries located in a different vascular territory.

Results Twenty-five UIAs were analyzed. There was a significant moderate correlation between CAWE and 5-mm PVE (Pearson R=0.52, P=0.008), whereas no correlation was found between CAWE and RVE (Pearson R=0.20, P=0.33). A stronger correlation was found between CAWE and 3-mm PVE (Pearson R=0.78, P<0.001). Intra-class correlation analysis demonstrated good reliability between measurements obtained using semi-automated and manual segmentation (ICC coefficient = 0.790, 95% CI 0.58 – 0.90).

Conclusion Parent arteries exhibit higher contrast enhancement in regions closer to the aneurysm's neck, especially in aneurysms $\geq$ 7 mm. A localized inflammatory/vasculopathic process in the wall of the parent artery may lead to aneurysm formation and growth.

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O-022 DUAL ANTIPLATELET THERAPY AFTER CAROTID ARTERY STENTING: TRENDS AND OUTCOMES IN A LARGE NATIONAL DATABASE

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Introduction Carotid artery stenting (CAS) is a safe and effective treatment for extracranial carotid artery atherosclerotic disease. While dual antiplatelet therapy (dAPT) is the standard of care following CAS, the optimal dAPT regimen and duration has not been established.

Methods We canvassed a large national healthcare claims database (IBM MarketScan) to identify patients receiving either carotid endarterectomy (CEA) or CAS for the primary indication of either ischemic stroke or carotid artery stenosis between 2007 and 2016. At least 6-months of continuous post-stent health care plan enrollment was required for inclusion. We performed univariable and multivariable regression methods to evaluate the impact of covariates on post-CAS stroke-free survival. Aggregate post-discharge antiplatelet (P2Y12 inhibitor) prescriptions were based on National Drug

Code terminology and number of prescribed days during the 6-months following CAS.

Results In total, 79,084 patients diagnosed with either ischemic stroke or carotid stenosis received either CEA (71,178; 90.0%) or CAS (7,906; 10.0%). After adjusting for available covariates, fewer than 180 days of prescribed post-CAS P2Y12 inhibition was associated with increased risk for stroke (<90 prescribed days HR=1.421, 95% CI 1.038–1.946; 90–179 prescribed days HR=1.484, 95% CI 1.045–2.106). The incidence of hemorrhagic complications was higher during the period of prescribed P2Y12 inhibition (1.16%/person-month vs 0.49%/person-month after discontinuation, p<0.001). The rate of extracranial hemorrhage was nearly 6-fold higher while on dAPT (6.50%/patient-month vs 1.16%/patient-month, $p<0.001$), and there was a trend towards higher rate of intracranial hemorrhage that did not reach statistical significance (5.09%/patient-month vs 3.69%/patient-month, $p=0.0556$). Later hemorrhagic events beyond 30 days post-CAS were significantly more likely to be extracranial than intracranial ($p=0.028$).

Discussion Increased duration of post-CAS dAPT is associated with lower rates of readmissions for stroke, and with increased risk of hemorrhagic complications, particularly extracranial hemorrhage. The potential benefit of prolonging dAPT with regard to ischemic complications must be balanced with the corresponding increased risk of predominantly extracranial hemorrhagic complications. Further studies are warranted to determine the optimal post-CAS antiplatelet regimen and duration.

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O-023 VOLUMETRIC AND SPATIAL ASSESSMENT OF CEREBRAL INFARCT AND PENUMBRA TISSUE FOR MULTIPLE COMPUTED TOMOGRAPHY PERFUSION SOFTWARE IN ACUTE ISCHEMIC STROKE PATIENTS

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Introduction/Purpose Utilization of computed tomography perfusion (CTP) to quantify infarct core and penumbra is commonly conducted to determine acute ischemic stroke patient (AIS) eligibility for endovascular intervention procedures. Accurate estimations of infarct and penumbra spatial location are essential as they provide information regarding the location of the vessel occlusion and regions where infarct will advance to. Discrepancies have been known to occur between various CTP software regarding volumetric calculations and spatial location of ischemic tissue due to different perfusion parameters and thresholds being used across software. This study aimed to assess the spatial and volumetric accuracy of RAPID, Sphere, and Vitrea CTP software predicted infarct and penumbra in comparison with final infarct from fluid-attenuation inversion recovery (FLAIR) magnetic resonance imaging (MRI).

Materials and Methods Sixty emergent large vessel occlusion AIS patients treated at a single comprehensive stroke center were included in this study. All patients were required to have undergone initial CTP imaging and 24-hour follow-up FLAIR MRI. Thirty endovascular intervention and 30 medical management patients were included to assess infarct and penumbra tissue, respectively. Endovascular intervention patients were required to have achieved complete successful reperfusion defined as thrombolysis in cerebral infarction 2c/3 to assure all penumbra was salvaged. For medical management patients, it is assumed that all estimated penumbra has converted to infarct on follow-up FLAIR MRI. Within RAPID, Sphere, and Vitrea CTP software, infarct and penumbra tissue was quantified and segmented. Volumetric assessment of CTP infarct and penumbra volumes were conducted using mean infarct differences and mean absolute error (MAE). Spatial accuracy of segmented ischemic tissue was assessed using Dice coefficients, overlap coefficients, sensitivity, specificity, and accuracy metrics.

Results Mean infarct differences, represented as 95% confidence intervals, between FLAIR MRI and each CTP software for each patient cohort are: Intervention patients- RAPID=4.9 ±6.4 mL, Sphere=-4.5±6.6 mL, Vitrea=3.5±4.9 mL; Medical management patients- RAPID=-40.0±23.3 mL, Sphere=-21.4 ±17.4 mL, Vitrea=7.4±10.3 mL. MAEs for predicted infarct from each software compared to FLAIR MRI infarct are: Intervention patients- RAPID=13.7 mL, Sphere=12.8 mL, Vitrea=7.3 mL; Medical management patients: RAPID=52.5 mL, Sphere=34.3 mL, Vitrea=18.9 mL. Spatial assessment metrics for ischemic tissue for each patient group and for each software are indicated in table 1.

Conclusions Volumetric results indicate RAPID, Sphere, and Vitrea CTP software all perform similarly in assessing volumetric agreement with final FLAIR MRI infarct for endovascular intervention patients. However, spatial agreement metrics indicate Vitrea performs the best in locating infarct for endovascular intervention patients. For medical management patients, Vitrea software appears the most accurate in assessing penumbra based on volumetric measurements in addition to overlap coefficients.

Disclosures R. Rava: None. **M. Mokin:** 1; C; NIH grant R21NS109575. 2; C; Canon Medical Systems Corporation, Cerebrotech, Imperative Care. **M. Waqas:** None. **J. Davies:** 1; C; National Center for Advancing Translational Sciences of the National Institutes of Health under award number KL2TR001413. 3; C; Penumbra. 4; C; RIST Neurovascular. **A. Siddiqui:** 2; C; Amnis Therapeutics, Boston Scientific, Canon Medical Systems USA Inc, Cerebrotech Medical Systems Inc, Cerenovus, Corindus Inc, Endostream Medical Ltd., Guidepoint Global Consulting, Imperative Care, Integra LifeSciences Corp, Medtronic, MicroVention, Northwest

Abstract O-023 Table 1 Degree of spatial accuracy for quantified infarct between each FLAIR MRI and each CTP software

Intervention Patients					
	Dice Coefficient	Overlap Coefficient	Sensitivity	Specificity	Accuracy
RAPD	0.49±0.13	0.55±0.14	0.50±0.12	0.99±0.01	0.98±0.01
Sphere	0.58±0.04	0.68±0.03	0.57±0.04	0.99±0.01	0.97±0.01
Vitrea	0.63±0.03	0.72±0.02	0.62±0.03	0.99±0.01	0.98±0.01
Medical Management Patients					
	Overlap Coefficient	Overlap Coefficient	Sensitivity	Specificity	Accuracy
RAPID	0.53±0.05	0.70±0.05	0.54±0.05	0.99±0.01	0.97±0.01
Sphere	0.59±0.03	0.74±0.03	0.60±0.03	0.98±0.03	0.98±0.01
Vitrea	0.67±0.03	0.74±0.03	0.66±0.04	0.99±0.01	0.98±0.01