Abstract E-054 Figure 1 Visualization of phantom under X-ray and MR. The MRI scans of the phantom demonstrate a passive tracking catheter place in the internal carotid

Methods Human-scale models of a carotid artery and cervical spine were adapted from the NIH 3D Print Exchange and printed using an Ultimaker 3 (Ultimaker, Geldermalsen, Netherlands). The vertebral model was used to create a negative silicone mold.

Bone Equivalent Material Epoxy resin representing a homogeneous mix of cortical and trabecular spongiosa was made using established methods. 36.4% Araldite GY 6010 and Jeffamine T-403 (Huntsman, The Woodlands, TX) were mixed (w/w) with 25.5% silicon dioxide (40–100 mesh sand) and 23.5% calcium carbonate (Sigma Aldrich, St. Louis, MO). The mixture was degassed, poured into the vertebral silicone mold, and cured at 20°C for 72 hours.

PVA-C Phantom PVA solution was made using previously established methods. Sevol Grade 165 PVA powder was used to create 1.5 L 10% (w/w) PVA. The solution was poured into a 1.8 L container, and the carotid artery and epoxy vertebral models were submerged. Four complete freeze-thaw cycles were performed. The carotid artery model was removed, leaving open lumens in the cryogel.

ImagingA gradient echo sequence was acquired at 3T (Discovery MR 750w, GE Healthcare, Milwaukee, WI). A 30 cm × 30 cm flat panel C-arm X-ray system guidance (Cios Alpha, Siemens Healthineers, Munich, Germany) was used to acquire X-ray images of the phantom.

Results MR and X-ray images showed a phantom with bone- and tissue-like properties (figure 1). Rigidity of the PVA-C was found to be sufficient for future navigation studies with test devices.

Conclusions The phantom showed promise as an important tool in imaging research to assess and improve future neuro-interventional devices. These initial steps provide the foundation for a human-scale phantom to test devices for integrated MR and X-ray imaging techniques.

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E-055 PATIENT CHARACTERISTICS, QUALITY AND OUTCOMES AFTER ENDOVASCULAR THERAPY FOR IN-HOSPITAL ISCHEMIC STROKE

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Introduction A significant number of acute ischemic strokes occur while patients are hospitalized for other reasons. No national data have been reported on endovascular therapy (EVT) for in-hospital onset stroke. Here we compare the patient characteristics, process measures of quality, and outcomes for in-hospital onset vs. community-onset of strokes in a large US national registry.

Methods We performed a retrospective cohort study of Get With The Guidelines-Stroke (GTWG-Stroke) from January 2008 to June 2018 from 2,333 participating sites that included 2,428,178 patients with acute ischemic stroke. Among 67,493 in-hospital onset strokes, 2494 (3.7%) underwent EVT. We examined the association between key patient characteristics (in-hospital onset, demographics, comorbidities, treatment with EVT) and functional outcomes using multivariable logistic regression models.

Results The rate of EVT increased from 2.5% in 2008 to 6.4% in 2018 ($p < 0.001$), with a significant and sustained increase in EVT after the second quarter of 2015 ($p < 0.0001$). Compared with patients with community-onset strokes, patients with in-hospital onset stroke had longer times to cranial imaging and arterial puncture but similar median NIHSS (16 (9 – 21) vs. 16 (10 – 21) Std Diff 1.9). Patients with in-hospital onset stroke were less likely to undergo EVT within 120 mins of symptom recognition, have

symptomatic intracranial hemorrhage, or ambulate independently at discharge. They were more likely to die or be discharged to hospice.

Conclusions Though use of EVT in GWTG-Stroke for in-hospital stroke remains low, it more than doubled in the past decade. Compared with community onset stroke, these patients have longer intervals to CT and arterial puncture, with associated worse functional outcomes. While there may be important differences in baseline patient characteristics between the groups, efforts must still be made to shorten time to reperfusion for in-hospital strokes.

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E-056

THE 'CLOT' SUMMIT – FIRST 5 YEARS OF A FOCUSED INCUBATOR PLATFORM FOR GUIDING STROKE RESEARCH

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Background Advances in stroke care like most innovations in medicine have happened gradually, over time, in increments and have typically benefitted from the collaborative efforts of a diverse group with a common goal. The CLOT summit inaugurated in 2015 created an ecosystem guided by these principles to evaluate and develop pathways for enhancing stroke care.

Methodology Three core groups are invited to participate. These include scientists involved in clot research, engineers involved in device development and physicians involved in interventional and medical treatment of acute ischemic stroke. The initial format followed a focused group discussion and presentation on key topics leading to development of targeted projects. In subsequent years the outcome from previous year's summit was evaluated and a future course in basic and clinical research charted. A key clinical component was improving procedural performance and defining unmet needs.

Results To date, the output has covered several areas. Basic clot research: ex vivo clot analysis resulted in five registries in the US (one) and the EU (four) with the aim of multicenter collection of thrombectomy specimen with centralized analysis. This has yielded several publications in the JNIS and elsewhere. Procedure optimization: Pre-intervention imaging analysis involved multiple contributions on thrombus imaging using CT/CTA/MR. In-Vitro modeling for thrombectomy procedures centered around procedural aspects (tortuosity, the effects of flow and pressure, embolization to new territory) and clot interaction (fibrinous or calcified clots versus friable clots). Progress in device iteration was part of procedure optimization based on in-vitro modeling and review of challenging cases highlighting a potential unmet solution. Clinical Studies: These were a product of the first two and involve clinical studies related to new devices and clinical registry for calcified clots.

Conclusion The CLOT summit represents a novel incubator platform bringing together expertise in a coordinated fashion that has resulted in meaningful basic and clinical contribution to the evolving stroke care. Key outcomes of the summit over the first 5-years are presented.

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E-057

CLOT PEROUSNESS BUT NOT DENSITY IS ASSOCIATED WITH FIRST-PASS RECANALIZATION OF ASPIRATION THROMBECTOMY IN THE COMPASS TRIAL

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Background Imaging clot characteristics such as clot density and perviousness (the latter is defined as a difference in regional clot density values between computed tomography angiography (CTA) and non-contrast CT [NCCT]), can be used as an imaging marker characterizing red blood cell and fibrin composition of the clot serving. We aimed to examine whether clot density and perviousness were associated with angiographic outcomes of aspiration and stent retriever thrombectomy in the COMPASS Trial: a Direct Aspiration First Pass Technique trial.

Methods Clot density (Hounsfield units, HU) and perviousness were measured by two operators who were blind to all the final angiographic and clinical outcomes except for the knowledge of stroke laterality. NCCT and CTA images were co-registered to accurately localize clot on both imaging modalities. The values were then matched with angiographic and clinical outcome data of the first pass for each randomization arm. Univariate and multivariate analysis was carried out to assess the association of clot density and perviousness using SPSS version 25.

Results Of the original 270 patients included in the COMPASS trial, 165 were eligible for the post-hoc analysis (81 patients in the aspiration first and 84 in the stent retriever first groups). There was no difference between the groups in regards to gender distribution, age, laterality and side of large vessel occlusion, smoking status of patients, and comorbidities. There was also no difference between the aspiration and stent retriever first randomization groups in regards to baseline clot Hounsfield units (HU) on NCCT (49.9 ± 8.2 vs. 47.8 ± 8.7, P=0.11), and perviousness (26.84 ± 21.8 vs. 22.8 ± 19.9, P=0.20). For the aspiration first group, there was a difference in mean perviousness values among patients who achieved TICI 2c-3 vs. TICI 2b vs. TICI 0-2a (33.1 ± 26, 35.9 ± 25.1, and 19.0 ± 14.2, respectively; P=0.016).