and/or resistant Gram-negative bacteria (rGNB) within 14 days. METHODS/STUDY POPULATION: Patients were recruited at 6 Michigan NFs from 09/16-08/18. VRE or rGNB colonization status was determined by culture swabs collected from multiple body sites at enrolment, day 7, and day 14. Our analysis focused on patients with no colonization at baseline, a perirectal swab collected at baseline, and at least one follow-up visit. The V4 hypervariable region of the 16S rRNA gene from bacterial DNA in each sample was PCR-amplified and sequenced on the MiSeq platform. Sequencing results were then processed with the *mothur* bioinformatics pipeline to classify bacterial taxa present in each sample. Taxa typically associated with the skin microbiota were removed. The primary outcome was acquisition of VRE and/or rGNB within 14 days. Exposures of interest included patient and microbiota characteristics. RESULTS/ANTICIPATED RESULTS: Among 61 patients, 18 (30%) acquired AROs within 14 days of enrolment (3 VRE, 13 rGNB, 2 both) (**Table 1**). The baseline microbiota features differed significantly in those who acquired a new ARO. Of the major 8 phyla found across samples, patients who acquired an ARO were depleted in the number of phyla present (5.74 ± 1.20 vs 5.06 ± 1.43; $p = 0.037$) (**Fig. 1**). The log10-transformed relative abundance of *Enterococcus* was enriched in patients who acquired an ARO (-0.32 ± 1.47) compared to those who did not (-1.68 ± 1.76; $p = 0.021$) (**Fig. 2**). Patients who did not acquire an ARO tended to harbour more butyrate-producing bacterial taxa and strict anaerobes, although the differences were not statistically significant (relative abundance of butyrate producer: 29.49 ± 22.09 vs 22.05 ± 17.76; anaerobes: 64.78 ± 23.54 vs 53.68 ± 27.61). DISCUSSION/SIGNIFICANCE OF IMPACT: Microbiota metrics calculated from perirectal samples are predictive of ARO acquisition. The clinical utility of perirectal samples thus warrants further assessment.

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Application of Design Sprint Methodology to Prototype a Proactive Outreach Tool for COPD Patients

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OBJECTIVES/GOALS: The primary objective of this study was to apply design sprint methodology to develop a proactive outreach tool prototype for patients with chronic obstructive pulmonary disease (COPD). METHODS/STUDY POPULATION: We utilized a 3-day process to align our team and key stakeholders behind answering the following question: "how might we empower COPD patients to understand their healthcare information, make decisions in partnership with their providers, and more easily manage their daily health?" On Day 1, we focused on understanding and defining the problem, and mapping the patient experience. On Day 2, we quickly brainstormed potential solutions, sketched our top ideas, and listed the solutions' inherent assumptions. On Day 3, we created a prototype of our top solution and storyboarded each step of the prototype experience to review its potential usability and comprehensibility with patients. RESULTS/ANTICIPATED RESULTS: At the end of the design sprint, our team developed a prototype centered around personalized communication between COPD patients and providers. The prototype focuses on augmenting the current transitional care management (TCM) workflow in the post-discharge period. We are working to further develop the prototype prior to formal testing with care coordinators and patients. We anticipate that our prototype will assist in automating the current TCM workflow and facilitate contact with more patients post-discharge. DISCUSSION/SIGNIFICANCE OF IMPACT: Contact with patients is currently challenging due limited resources and the time sensitive nature of the TCM requirements. Automated patient outreach may be especially effective in engaging patients on a large scale, while also minimizing time and resources needed from healthcare staff.

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Astrocyte LDLR-Related Protein 1 Increases Cytokine Sensitivity – The Role of Glia in Recovery after Brain Damage

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OBJECTIVES/GOALS: The limited treatment options for ischemic stroke patients have resulted in stroke being a leading cause of death and the primary cause of long-term disability in the U.S. Finding effective treatment options requires a better fundamental understanding of the ongoing processes that contribute to poor long-term outcome. METHODS/STUDY POPULATION: Expression of Apolipoprotein E4 predisposes stroke patients to poor long-term outcome. This study aims to test one possible mechanism by which ApoE4 contributes to cognitive decline after stroke. Here, we examine the effect of a major ApoE4 receptor, low-density lipoprotein receptor related protein 1 (LRP1) on sensitivity to stress in astrocytes. LRP1 binds and moves extracellular ligands and plasma membrane proteins into the endocytic system. Others have shown that LRP1 regulates cell-surface TNF receptor (TNFR1) in non-astrocytic cells. We propose That LRP1 similarly regulates TNFR1 in the central nervous system to attenuate inflammatory response after stroke. Studies have shown that ApoE4 slows the recycling of endocytic LDL receptors. We hypothesize that ApoE4 inhibits the ability of LRP1 to remove TNFR1 from the plasma membrane. This is expected to increase cytokine sensitivity, resulting in worse outcome after stroke. We investigated the effect of LRP1 on astrocyte TNFα signaling and response in immortalized ApoE null mouse astrocytes subjected to lentiviral-mediated knockdown of LRP1. The astrocyte response to TNFα stimulation was tested in a time dependent manner using Western blotting of NFkB pathway components, which are the downstream mediators of TNFα signaling. We also tested astrocyte viability after prolonged TNFα stimulation using Alamar Blue reagent. We found that LRP1 deficient cells have increased phosphorylation of NFkB upon TNFα stimulation, and that loss of LRP1 resulted in significant loss of astrocyte viability after prolonged stimulation. RESULTS/ANTICIPATED RESULTS: Altogether, our results indicate that loss of LRP1 renders astrocytes more sensitive to TNFα. Future experiments will focus on testing the influence of LRP1 on recovery after middle cerebral artery occlusion in mice. DISCUSSION/SIGNIFICANCE OF IMPACT: These studies will elucidate how astrocyte-LRP1 contributes to outcome after stroke, and helps us to understand one potential way that ApoE4 exerts pathological effects. A better understanding of the long-term processes after stroke will allow identification of therapies which improve the morbidity and mortality associated with stroke. CONFLICT OF INTEREST DESCRIPTION: NA.

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