Dr. Karina Davidson

Project Summary

Background: The PCORI Methodology Committee report identified the heterogeneity of treatment effect (HTE) as one of the priority methods gaps to be addressed, and we will do so by laying the foundation necessary for conducting N-of-1 randomized controlled trials (RCTs). HTEs are large for many treatments; some treatments have large benefits for some patients but are minimally effective or even harmful for others. N-of-1 RCTs address this gap by providing empirical data on each individual patient's own treatment effect. Although N-of-1 RCTs have been discussed for decades and used occasionally to great effect, significant barriers and methodological issues currently limit their use for improving outcomes for the majority of patients in the United States.

N-of-1 RCTs are multiple crossover trials conducted within individual patients. Instead of comparing two groups of patients on different treatments, they focus on the individual patient by randomizing time periods (e.g., weeks) in which that patient receives different treatments. Thus, N-of-1 RCTs can provide precise data on the effect of a treatment for the individual patient, so patients can work with their clinician to decide upon optimal treatment. HTE then becomes immaterial.

Methods: We will conduct a three-phase study of N-of-1 methods with primary care patients who have two or more chronic medical conditions. In the first phase, we will conduct focus groups to determine which conditions and symptoms we should target and which features of N-of-1 trials are optimally acceptable to patients. In the second phase, we will conduct a national survey of patients to prioritize the symptoms, treatments, outcomes, and design features that are most important to them. In the third phase, we will create prototype N-of-1 trial designs and have patients assess the design features and their willingness to participate in such trials.

Objectives: The objectives of the study are to identify a promising set of medical conditions and methodologies for N-of-1 RCTs, create educational materials to inform patients of the pros and cons of these trials, and determine which directions these methods should take to be most useful to patients.

Patient and Stakeholder Engagement: The study will engage patients and other key stakeholders (clinicians, researchers, statisticians, pharmacists, and ethicists) to prospectively shape the research and methods agenda of an N-of-1 RCT approach.

Anticipated Impact: The results of this research will allow us to compare the effect of conducting N-of-1 RCTs versus usual care on patient-chosen outcomes such as symptoms, disease control, and satisfaction with care.