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Pilot Study For Using Fitbit Activity Trackers To Monitor And Predict Onset Of CAR-T Cell Immunotherapy Related Adverse Events Including Cytokine Release Syndrome

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Introduction: Immunotherapy using T Cells with engineered chimeric antigen receptors (CAR) is a revolutionary modality for treating cancer, especially B cell malignancies. It also has specific toxicities. The most common toxicities observed are cytokine-release syndrome (CRS) and neurotoxicity. These therapy-related adverse events can range from mild to fatal. If appropriately and timely treated, they have a good prognosis. Thus, further insight into predictive biomarkers can help clinical management of patients and reduce morbidity and mortality.

Objective: One of the constitutional symptoms associated with CRS is fatigue. With the advent of activity tracking digital technology, I propose a pilot study exploring the use of fitness trackers to quantify activity level as a potential predictive biomarker of CRS due to CAR T-Cell immunotherapy.

Methods: The proposed study would be a single-arm trial. Patients who are receiving CAR-T Cell immunotherapy will be given a Fitbit Flex 2™ tracker. One week of activity data (measured as steps per day) prior to CAR-T Cell infusion will establish patient baseline activity. From the date of infusion, activity levels will continue to be tracked and analyzed through CRS onset. The patient data will be gathered from Fitbit's server via a customized app built using Fitbit's Web Application Programming Interface (API).

Results: This is a proposed study. No results have been gathered.

Discussion: If a correlation is established between activity levels and onset of CRS, it would enhance the current predictive algorithm, allow easier outpatient management and remote monitoring, decrease costs, and reduce morbidity and mortality.