Technical Summary of Research Activities:
Dr. Afshar's informatics and data science laboratory with Dr. Cara Joyce is dedicated to early identification and treatment in critically ill patients, specifically those with substance misuse, acute respiratory distress syndrome, and sepsis. The lab employs methods in natural language processing (NLP) and machine learning in collaboration with Dr. Dmitriy Dligach’s computer science lab at the Loyola Lakeshore Campus. We have built an infrastructure to perform NLP and machine learning tasks with electronic health record data for high throughput computable phenotypes and applied predictive modeling. We have published work deriving and validating NLP classifiers for substance misuse, ARDS identification, and prediction of sepsis development. We are working on automated methods in substance misuse screening and designing quasi-experimental studies as well as adaptive platform clinical studies using both supervised and unsupervised machine learning methods.

Non-Technical Summary:
The lab of Drs. Majid Afshar and Cara Joyce is a federally-funded (through the National Institutes of Health/NIH) lab to conduct clinical research from electronic health records with applications in artificial intelligence to accomplish three goals: (1) health outcomes and health inequities research; (2) applied predictive modelling; and (3) high throughput phenotyping. Our lab brings together physician-scientists, biostatisticians, and computer scientists in a multidisciplinary approach to medical informatics research. Our aim is to provide research that is operational and may be implemented in real-time. Beyond providing sophisticated implementation of predictive analytics, our team’s mission is to align with the priorities of Loyola and the Healthy Chicago 2.0 plan to ensure decision-making algorithms promote health equity and minimize the hidden biases of health systems.

Training Opportunities in the (Majid Afshar and Cara Joyce) Lab:
Students, fellows or residents who join Dr. Afshar’s lab can expect to receive training in data science with a focus on models formed from electronic health record data. Trainees will learn coding in R and Python languages, data staging and modelling, validation and prediction methods, and phenotyping tasks. The trainee also will become familiar with health outcomes research and clinical study design.