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The University of Texas Health Science Center at Houston
School of Biomedical Informatics

DSICCR Tuesday Seminar Series

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DEPOT: graph artificial intelligence to reveal health trajectories of chronic kidney disease for precision medicine

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Chronic kidney disease (CKD) is common, affecting 14.8% of US adults, and disproportionately more in diverse and underserved communities. Among the modifiable risk factors, drug induced acute kidney injury (AKI) contributes to CKD development and progression. Electronic health records (EHRs) from electronic medical records (EMR) and health insurance claims data can help predict disparate CKD progression trajectories and uncover novel, trajectory-specific risk factors. The Indiana University School of Medicine (IUSM) EHR collection includes rich clinical information for 85 million individuals from regional and national populations over two decades. The IUSM EHR collection is composed of Optum EHR derived from the Optum Clinformatics™ claim data and the Indiana EHR incorporated from the EMR data of Indiana Network for Patient Care (INPC) Research Database, Indiana University Health (IUH), and Eskenazi Health (EH). Our team is developing the DisEase PrOgression Trajectory (DEPOT), an evidence-driven, graph-based clinical informatics approach to model CKD progression trajectories and individualize clinical decision support. DEPOT is generating novel knowledge about the landscape of CKD health trajectories, bridging gaps between rich longitudinal EHR data and decision support for precision medicine in CKD. Our work will shift paradigms of big data and complex disease research, enabling EHR data to become part of daily CKD management.

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