

FHIR-Based Prediction of Hospital Readmission for Patients Aged 50 Plus

Group 13

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Abstract

Hospital readmissions in patients aged 50 and above continue to pose a significant challenge for healthcare systems, greatly affecting patient outcomes and associated healthcare expenses. This research seeks to create a sophisticated, FHIR-oriented prediction model that leverages artificial intelligence methods to forecast hospital readmissions for patients aged 50 and above. By utilizing various data types such as ORU (observation results), CCDA (consolidated clinical document architecture summaries), and ADT (admission, discharge, transfer) information, the model will standardize the data through Fast Healthcare Interoperability Resources (FHIR) to boost interoperability and enhance data quality. Our research will develop a comprehensive dataset from scratch using disparate data mentioned above from various healthcare systems. We will emphasize on patient demographics, lab results, and hospital usage trends to develop a tailored risk of readmission evaluation tool. We will utilize machine learning techniques, such as tree based models, ensemble methods and other advanced algorithms. The performance of the models will be evaluated based on AUROC, sensitivity and specificity which are expected to be better compared to current models like LACE and HOSPITAL scores. In addition to forecasting readmission risk, the system will provide practical suggestions customized for each patient's profile. Such interventions could involve medication review, scheduling follow-ups, lifestyle changes, and specific care plans after discharge. By incorporating FHIR standards, the model guarantees smooth integration with current electronic health record systems, facilitating immediate risk evaluation and decision-making assistance. This FHIR-based AI model has the potential to revolutionize hospital readmission prevention tactics by enabling the early detection of high-risk patients and aiding personalized preventive approaches. This innovative project seeks to lower readmission rates, enhance patient results, and better allocate resources in healthcare environments. Additionally, the results will promote the implementation of AI-based healthcare solutions and illustrate the real-world use of FHIR standards in healthcare systems, representing an important advancement in predictive analytics for elderly patient groups.