Informatics Tools to Implement Late Cardiovascular Risk Prediction Modeling for Population Management of High-Risk Childhood Cancer Survivors

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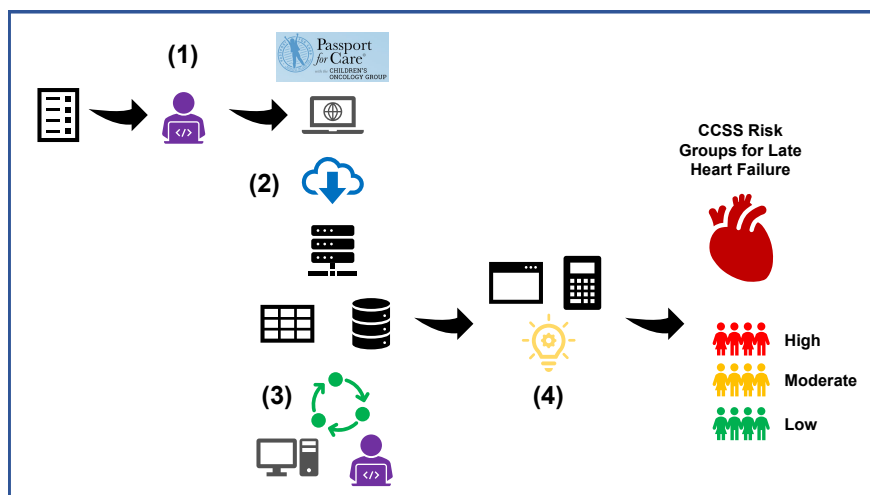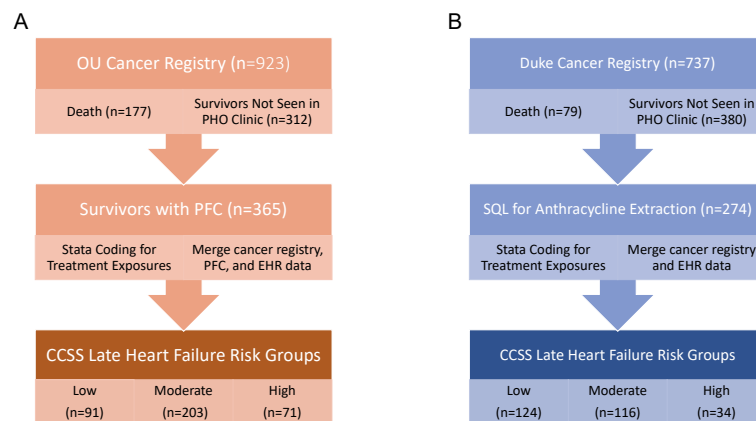[5]Duke University Department of Medicine

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Abstract

Background: Clinical informatics tools to integrate data from multiple sources have the potential to catalyze population health management of childhood cancer survivors at high risk for late heart failure through the implementation of previously validated risk calculators. **Methods:** The Oklahoma cohort (n=365) harnessed data elements from Passport for Care (PFC) and the Duke cohort (n=274) integrated cancer registry and electronic health record data, using standard query language, to automatically extract chemotherapy exposures for survivors <18 years old at diagnosis. The Childhood Cancer Survivor Study (CCSS) late cardiovascular risk calculator was implemented and risk groups for heart failure were compared to the Children's Oncology Group (COG) Long-Term Follow-up Guidelines. **Results:** The Oklahoma and Duke cohorts both observed good overall concordance between the CCSS and COG risk groups for late heart failure with weighted Kappa statistics of 0.70 and 0.75, respectively. Low-risk groups showed excellent concordance (Kappa >0.9). Moderate and high-risk groups showed moderate concordance (Kappa 0.44-0.60 across both cohorts). In the Oklahoma cohort, adolescents at diagnosis were significantly less likely to receive guideline-adherent care for echocardiogram surveillance compared with survivors <13 years old at diagnosis (OR 0.22; 95% CI 0.10-0.49). **Conclusions:** Clinical informatics tools represent a feasible approach to leverage discrete data elements regarding key treatment exposures from PFC or the EHR to successfully implement previously validated late cardiovascular risk prediction models on a population health level. Real-world evidence on the concordance of CCSS, COG, and IGHG risk groups promises to refine current guidelines and identify inequities in guideline-adherent care.

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