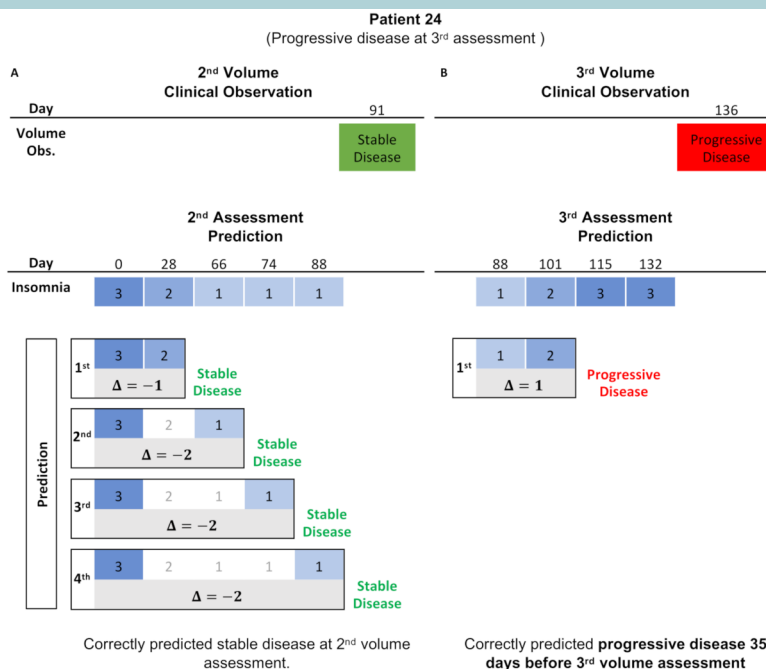# Leveraging Patient-Reported Outcome Dynamics to Predict Treatment Response

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Figure 5

Patient-reported outcomes (PROs), collected using standardized questionnaires at various time points throughout a patient's care, provide an unbiased assessment of a patient's health condition, reported directly by the patient. Recent studies have shown that changes in PROs over time can be early indicators of clinically important events such as cancer development and survival. While incredibly promising, these studies fail to consider the patient-specific dynamics of individual PROs and how they might be leveraged to predict individual patient responses to treatment. This is especially important in non-small cell lung cancer (NSCLC), which has the lowest survival rates among all cancers. In this talk, we demonstrate how PRO dynamics can be used as inter-radiographic predictors of tumor volume changes. That is, how PROs can be leveraged between radiographic scans to predict tumor volume dynamics. This is assessed in 108 NSCLC patients receiving immune checkpoint inhibitors. The patients completed biweekly PRO questionnaires and received monthly tumor volume scans. We found that changes in volume were significantly correlated with dizziness ($p<0.005$), insomnia ($p<0.05$), and fatigue ($p<0.05$). Further analysis revealed that changes in insomnia could predict progressive disease with a 77% accuracy, with correct predictions of progressive disease occurring on average 45 days prior to the next imaging study. Our study is an important first step in understanding how PROs can be utilized as a non-invasive and easily-obtained biomarker of when to change treatment to delay the development of treatment progression.

Tuesday, October 3, 2023 @ 4:00PM ET in Clark 110

Live Webcast: https://wse.zoom.us/j/95676026583

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