A wide range of markers have become available as potential tools to predict risk or progression of disease. In addition to such biological and genetic markers, short term outcome information may be useful in predicting long term disease outcomes. When such information is available, it would be desirable to combine this along with predictive markers to improve the prediction of long term survival. Most existing methods for incorporating censored short term event information in predicting long term survival focus on modeling the disease process and are derived under restrictive parametric models in a multi-state survival setting. When such model assumptions fail to hold, the resulting prediction of long term outcomes may be invalid or inaccurate. When there is only a single discrete baseline covariate, a fully non-parametric estimation procedure to incorporate short term event time information has been previously proposed. However, such an approach is not feasible for settings with one or more continuous covariates due to the curse of dimensionality. In this paper, we propose to incorporate short term event time information along with multiple covariates collected up to a landmark point via a flexible varying-coefficient model. To evaluate and compare the prediction performance of the resulting landmark prediction rule, we use robust non-parametric procedures which do not require the correct specification of the proposed varying coefficient model. Simulation studies suggest that the proposed procedures perform well in finite samples. We illustrate them here using a dataset of post-dialysis patients with end-stage renal disease.