

We propose a doubly robust estimation method for the optimal treatment regime based on an additive hazards model with censored survival data. Specifically, we introduce a new semiparametric additive hazard model which allows flexible baseline covariate effects in the control group and incorporates marginal treatment effect and its linear interaction with covariates. In addition, we propose a time-dependent propensity score to construct an A-learning type of estimating equations. The resulting estimator is shown to be consistent and asymptotically normal when either the baseline effect model for covariates or the propensity score is correctly specified. The asymptotic variance of the estimator is consistently estimated using a simple resampling method. Simulation studies are conducted to evaluate the finite-sample performance of the estimators and an application to AIDS clinical trial data is also given to illustrate the methodology.