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The object of our present study is to develop a piecewise constant hazard model using an artificial neural network (ANN) to capture the complex shapes of the hazard functions, which cannot be achieved with conventional survival analysis models like Cox proportional hazard. We proposed a more convenient approach to piecewise exponential artificial neural network model (PEANN) created by Fornili et al. to handle a large amount of data. In particular, it provides much better prediction accuracies over both the Poisson regression and generalized estimating equations. This has been demonstrated with lung cancer patient data taken from Surveillance, Epidemiology and End Results (SEER) program. The quality of the proposed model is evaluated using several error measurement criteria. (Received September 20, 2016)