The methodology to predict events will use the process mining approach to determine the pathways of care as part of the model. The particular prediction methodology will depend on the variable that wants to be predicted.

When trying to answer whether a clinical process will be successful or not, or an event will take place in, a data data driven approach will be carried out with data of the clinical features of the patient. Methodologically a predictive Clustering tree (S. Pravilovic, A. Appice and D. Malerba, “Process Mining to Forecast the Future of Running Cases,” NEW FRONTIERS IN MINING COMPLEX PATTERNS, NFMCP 2013, 2014), Classification and regression trees (CART) (H. Horita, H. Hirayama, T. Hayase, Y. Tahara and A. Ohsuga, “Process Mining Approach Based on Partial Structures of Event Logs andDecision Tree Learning,” PROCEEDINGS 2016 5TH IIAI INTERNATIONAL CONGRESS ON ADVANCED APPLIEDINFORMATICS IIAI-AAI 2016, 2016) , Support vector machines (B. Kang, D. Kim, S. Kang and -H, “Periodic performance prediction for real-time business process monitoring,” Industrial Management & Data Systems, 2012) can be used to classify and predict the forecoming events or the probability of achieving a certain clinical goal. By exploiting data related to the clinical history of patients with similar characteristics decision tree based strategies will aim at providing predictions about whether the patients will recover (F. M. Maggi, C. Di Francescomarino, M. Dumas and C. Ghidini, “Predictive Monitoring of Business Processes,” ADVANCED INFORMATION SYSTEMS ENGINEERING (CAISE 2014), 2014).

The prediction of the process path can also be of great interest in order to predict the possible treatment sequences or paths based on successful patient records and carry out his treatment accordingly in order to is to decide the best possible next step to complete a task successfully. The similarity of the sequences will be determined using a distance measurement meaning the number of changes that one process would require to be identical to the other process that it is being compared with, and for that prediction purpose KNN with Markov model and sequence alignment can be used. (M. Le, B. Gabrys and D. Nauck, “A hybrid model for business process event prediction,” Res. and Dev. in Intelligent Syst. XXIX: Incorporating Applications and Innovations in Intel. Sys. XX - AI 2012, 32nd SGAI Int. Conf. on Innovative Techniques and Applications of Artificial Intel., 2012)

Finally, in order to respond at when a treatment will achieve a particular goal, time based prediction strategies like Naïve Bayes classifier (M. Polato, A. Sperduti, A. Burattin and M. De Leoni, “Data-aware remaining time prediction of business process instances,” Proceedings of the International Joint Conference on Neural Networks, 2014) or hidden Markov models (S. Pey, S. Nepal and S. Chen, “A Test-bed for the Evaluation of Business Process Prediction Techniques,” ColiaborateCom 2011 - Proceedings of the 7th International Conference on Collaborative Computing: Networking, Applications and Worksharing, 2011) can be used in the predictive model development.