Adequate staging procedures are the prerequisite for individualized therapy concepts in cancer, particularly in the adjuvant setting. Molecular staging markers tend to characterize specific, fundamental disease processes to a greater extent than conventional staging markers. At the biological level, the course of the disease will almost certainly involve interactions between multiple underlying processes. Since new therapeutic strategies tend to target specific processes as well, their impact will also involve interactions. Hence, assessment of the prognostic impact of new markers and their utilization for prediction of response to therapy will require increasingly sophisticated statistical tools that are capable of detecting and modeling complicated interactions. Because they are designed to model arbitrary interactions, neural networks offer a promising approach to improved staging. However, the typical clinical data environment poses severe challenges to high-performance survival modeling using neural nets, particularly the key problem of maintaining good generalization. Nonetheless, it turns out that by using newly developed methods to minimize unnecessary complexity in the neural network representation of disease course, it is possible to obtain models with high predictive performance. This performance has been validated on both simulated and real patient data sets. There are important applications for design of studies involving targeted therapy concepts and for identification of the improvement in decision.
support resulting from new staging markers. In this article, advantages of advanced statistical methods such as neural networks for definition of new staging models will be illustrated using breast cancer as an example.

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