

Identifying Patients at High Risk for Neutropenic Complications During Chemotherapy for Metastatic Breast Cancer With Doxorubicin or Pegylated Liposomal Doxorubicin: The Development of a Prediction Model.

Dranitsaris G, Rayson D, Vincent M, et al. *Am J Clin Oncol* 2008;**31**(4):369-374.

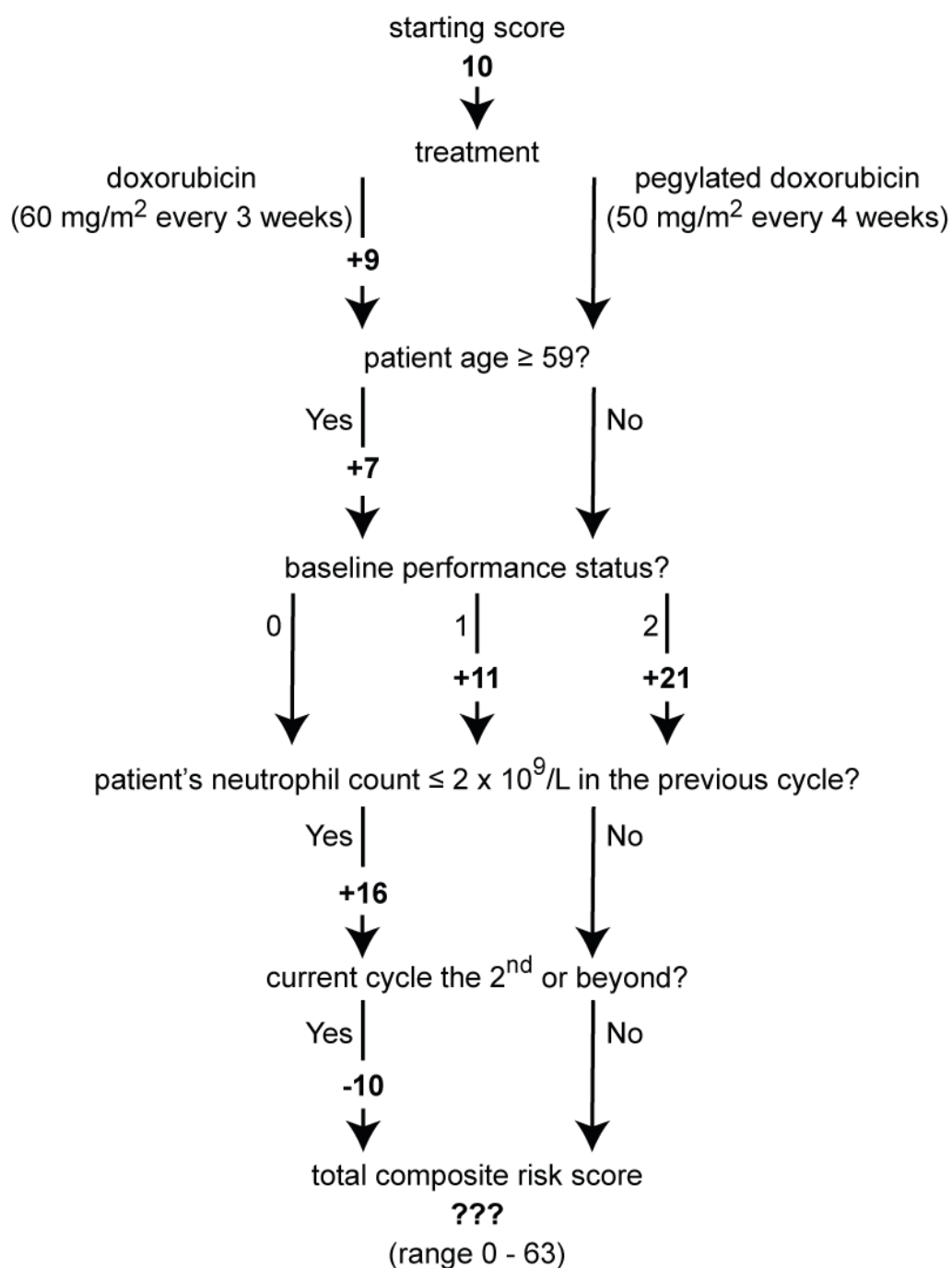
Study overview: Data from a prospective multicenter randomised trial were analysed to develop a cycle-based model for the prediction of neutropenic complications (NC) in 509 patients with metastatic breast cancer (MBC) receiving doxorubicin- or pegylated liposomal doxorubicin (PLD)-based chemotherapy. Univariate screening and multivariable GEE regression analysis were used to identify patient or treatment variables most closely associated with NC.

Key findings: Five variables, namely treatment with doxorubicin (compared with PLD), patient age ≥ 59 years, baseline performance status > 0 , first chemotherapy cycle vs. later cycles, and an absolute neutrophil count $\leq 2 \times 10^9/L$ during the previous cycle, were found to be predictors of NC. From the regression coefficients identified, a scoring algorithm was derived to determine the NC risk for each patient at each cycle (see figure below). Values obtained were between 0 and 63, with higher scores indicating higher risk. Receiver operating characteristic (ROC) analysis supported the predictive accuracy of the model within the study population. A risk score of between ≥ 25 and < 35 optimised sensitivity (58%) and specificity (79%), correctly classifying 78% of patients. Patients with a pre-cycle risk score at or beyond this threshold would be considered at high risk of developing NC in later cycles.

Conclusions: The authors conclude that their model may be a valuable tool to assess NC risk more accurately. External validation of the model on independent patient samples is required, and the authors caution that its predictive capacity is limited to MBC patients on single agent doxorubicin or PLD treatment. This scoring algorithm is valuable in that it is able to integrate multiple risk factors, which are frequently observed in MBC patients, to predict risk of FN. In addition, the model has the advantage of being cycle-based, allowing a reassessment of patients' risk prior to each new chemotherapy cycle. This easy-to-apply prediction model may be an important source of patient-specific risk information and may enhance patient care by enabling a more precise targeting of G-CSF prophylaxis, or safer alternatives to doxorubicin, to those patients most likely to experience NC.

<http://www.ncbi.nlm.nih.gov/pubmed/18845996>

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