

Analytics approach could improve chemo combinations

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(HealthDay)—Models based on machine learning and optimization could

improve chemotherapy regimens to be tested in phase III clinical trials without altering the toxicity outcomes, according to a study published in the May issue of *Management Science*.

Dimitris Bertsimas, Ph.D., from Massachusetts Institute of Technology in Cambridge, and colleagues developed models to predict the outcomes of [clinical trials](#) testing [combination chemotherapy](#) regimens before they are run and to identify combination chemotherapy regimens to be tested in phase II and III trials. The models were developed in order to improve the quality of regimens tested in phase III trials.

The researchers built a database of 414 clinical trials for advanced gastric cancer. This was used to develop statistical models that could obtain an out-of-sample R^2 of 0.56 for predicting median overall survival and an out-of-sample area under the curve of 0.83 for predicting the unacceptability of high toxicity. Models were proposed that use machine learning and optimization to suggest regimens for phase II and III trials. Two techniques were used for estimating the quality of regimens selected by these models, compared with those tested in current clinical practice. Both techniques suggested that the models could improve the efficacy of the selected regimens for testing in [phase III](#) clinical trials, without altering toxicity outcomes.

"This evaluation of the proposed models suggests that they merit further testing in a clinical trial setting," the authors write.

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