



COMMENT ON SEGAR ET AL.

Machine Learning to Predict the Risk of Incident Heart Failure Hospitalization Among Patients With Diabetes: The WATCH-DM Risk Score. *Diabetes Care* 2019;42:2298–2306

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We congratulate Segar et al. (1) on their prediction of hospitalization for heart failure (HHF) in type 2 diabetes, which confirms our previously published finding (2). Indeed, we have used a more sophisticated approach (machine learning, left truncation, time-varying risk factors, parametric proportional hazard) with a superior predictive capability (5-year c-statistic >0.80) for Action to Control Cardiovascular Risk in Diabetes (ACCORD) patients without heart failure at baseline. We have risk equations not just for HHF and other cardiovascular events, but for a wide range of complications of diabetes, including microvascular complications. Indeed, the latter are also used to further predict future cardiovascular events that are made likely by microvascular events (3). An online tool to calculate the Building, Relating, Assessing, and Validating Outcomes (BRAVO) risk models has been made publicly available at www.bravo4health.com.

The approach used by Segar et al. has the advantage of simplicity using integers. However, it is not clear whether the conversion of continuous variables such as age and blood pressure into dichotomous ones was used in model selection; if not, prediction accuracy may be less than is suggested in the internal validation subset of the trial cohort.

Further, their method requires electrocardiogram parameters that may not be available in primary care. Not only is the BRAVO risk engine possibly more precise, its simplicity allows it to be integrated with information that is routinely collected within an electronic medical record and then inform the clinician about risk at the point of care without any further input—an approach currently being evaluated in clinical practice.

Segar et al. have validated their engine using a subgroup of a blood pressure-lowering trial, which may not be the most robust method. We have validated BRAVO in prediction of the results of several diabetes cardiovascular outcome trials, demonstrating high predictive value of all events, including HHF (4), utilizing simple clinical baseline data.

Segar et al. rightly suggest that such risk engines may be useful in predicting who would benefit from the use of sodium–glucose cotransporter 2 inhibitors. We agree, but we caution that the risk of HHF in a U.S. population without heart failure at baseline is very low and the cost effectiveness of such an approach at primary prevention is unclear. We are evaluating the cost effectiveness of various novel approaches in diabetes management with the BRAVO risk engine (5).

Duality of Interest. All three authors have ownership interest in the BRAVO risk engine and BRAVO4Health, LLC. No other potential conflicts of interest relevant to this article were reported.

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