



# Prediction of the Presence of Ventricular Fibrillation From a Brugada Electrocardiogram Using Artificial Intelligence

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In this issue of the Journal, Dr. Nakamura and colleagues investigate the use of artificial intelligence (AI) to predict ventricular arrhythmias in a cohort of patients with Brugada syndrome from Japan.<sup>1</sup> The study was well conducted with an adequately sized patient cohort. Its strengths include the use of >2,000 automated ECG recordings that were free from observer bias. Comparisons were made between the newly developed model and published risk score by Dr. Sieira and colleagues. The model was well validated internally, with a high accuracy and negative predictive value. Of note, the Sieira model has been most frequently validated and shows an area under the receiver operating characteristic curve (AUROC) of 0.71–0.81.<sup>2,3</sup> That model requires the input of clinical and ECG variables for risk prediction. By contrast, the advantage of the model by Dr. Nakamura and colleagues is that only ECG data are required, and despite this, achieves an AUROC of 0.80.

Given the dynamic nature of the disease, serial ECG recordings often fluctuate, leading to subtle or overt differences or visit-to-visit variability in the ECG waveforms.<sup>4,5</sup> To tackle this, the authors conducted per patient analysis whereby all of the ECGs obtained from the different visits were analyzed and the AI model calculated the percentage of the ECGs that were predicted positive. The authors noted that some cases were predicted to be positive despite showing a non-type 1 Brugada pattern, or negative despite showing a type 1 pattern. This is not entirely surprising given that the type of Brugada pattern is only one of many factors associated with ventricular arrhythmias. Some limitations of this study should be noted. The positive predictive value was low, and although important baseline

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characteristics, such as the age of presentation and sex, were recorded, they were not used as input variables. Finally, there was no external validation. Future studies could consider comparing whether manual selection of ECG variables or automatic selection of ECG features by AI led to differences in the performance metrics.

## Data Availability

No data were generated by this manuscript.

## References

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