Table 2: Independent Validation of the Two Top Performing Classifiers Against Novel Medical Record ASD Score Data

Classifier Type	Methods*	Subjects	Findings	Publication
A 7-feature alternating decision tree (ADTree7)	Independent validation study Full sets of answers to the ADI-R* were downloaded from the Simons Simplex Collection (SSC) and Boston Autism Consortium (AC) data repositories. These were novel sources of data that had not previously been used in training, testing or classifier construction. The accuracy of the classifier was assessed against score data from these repositories.	**n=1993** With ASD: 1976 No ASD: 17 Breakdown by repository: SSC subjects: With ASD n=1654 No ASD n=5 AC subjects With ASD n=322 No ASD n=12	SSC repository analysis: the classifier accurately classified 1654 of the 1654 cases with ASD (100% accuracy). AC repository analysis: the classifier accurately classified 321 of the 322 cases with ASD (99.7% accuracy). Three of the five non-ASD SSC subjects were accurately classified, and 6 of the 12 AC subjects were accurately classified.	Wall DP, Dally R, Luyster R, Jung JY, Deluca TF. Use of artificial intelligence to shorten the behavioral diagnosis of autism. *PLoS One.* 2012;7(8):e43855.
8-feature alternating decision tree (ADTree8)	Independent validation study Complete ADOS** Module 1 score sheets were acquired from five data repositories (Boston Autism Consortium, Simons Simplex Collection version 14, Simons Variation In Individuals Project, Autism Genetic Resource Exchange, and National Database for Autism Research data sets). These were novel sources of data that had not previously been used in training, testing or classifier construction. Domain scores were computed according to the ADOS-G diagnostic algorithm, and individuals were classified into categories of autism, autism spectrum and non-spectrum based on meeting specified thresholds in each domain. For this study, categories of autism and autism spectrum were combined to test the ability of the classifier to distinguish spectrum cases from non-spectrum controls. Accuracy of classifier outcomes was tested against the outcomes provided by the original and current ADOS algorithms, the best estimate clinical diagnosis, and the comparison score severity metric associated with ADOS-2.	**n=2616** With ASD: 2333 No ASD: 283	The classifier was significantly correlated with the ADOS-G (r=-0.814) and ADOS-2 (r=-0.779) and exhibited >97% sensitivity and >77% specificity in comparison to both ADOS algorithm scores. The correspondence to the best estimate clinical diagnosis was also high (accuracy=96.8%), with sensitivity of 97.1% and specificity of 83.3%. The correlation between the OBC score and the comparison score was significant (r=-0.628).	Duda, M., Kosmicki, J. A. & Wall, D. P. Testing the accuracy of an observation-based classifier for rapid detection of autism risk. *Transl. Psychiatry* 4, e424–e424 (2014).

*The Autism Diagnostic Interview-Revised; **Autism Diagnostic Observation Schedule