

Machine learning can predict aggressive behaviors in youth with autism

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For inpatient youths with autism, machine learning analyses of preceding changes in peripheral physiology can predict imminent aggressive behaviors before they occur, according to a study published online Dec.

21 in *JAMA Network Open*.

Tales Imbiriba, Ph.D., from Northeastern University in Boston, and colleagues conducted a noninterventional prognostic study using data obtained from March 2019 to March 2020 from 70 psychiatric inpatients with confirmed diagnoses of autism exhibiting operationally defined self-injurious behavior, emotion dysregulation, or aggression toward others from four [primary care](#) psychiatric inpatient hospitals.

Overall, 32 individuals were minimally verbal and 30 had an intellectual disability. Study participants wore a commercially available biosensor that recorded peripheral physiological signals. Time-series features extracted from biosensor data were analyzed.

The researchers recorded 429 naturalistic observational coding sessions, totaling 497 hours, wherein 6,665 [aggressive behaviors](#) were documented, including self-injury, emotion dysregulation, and aggression toward others (59.8, 31.0, and 9.3 percent, respectively).

Across all experiments, [logistic regression](#) was the best performing overall classifier (e.g., predicting aggressive behavior three minutes before onset; mean area under the receiver operating characteristic curve, 0.80).

"Our findings may lay the groundwork for developing just-in-time adaptive intervention mobile health systems that may enable new opportunities for preemptive intervention," the authors write. "By focusing on reducing the unpredictability of [aggressive behavior](#), we anticipate that this ongoing research program may enable inpatient youths with autism to more fully participate in their homes, schools, and communities."

More information: Tales Imbiriba et al, Wearable Biosensing to

Predict Imminent Aggressive Behavior in Psychiatric Inpatient Youths With Autism, *JAMA Network Open* (2023). DOI: [10.1001/jamanetworkopen.2023.48898](https://doi.org/10.1001/jamanetworkopen.2023.48898)

Margaret R. Gifford et al, Wearable Technology—Another Tool in the Assessment and Treatment of Challenging Behavior Toolbox, *JAMA Network Open* (2023). DOI: [10.1001/jamanetworkopen.2023.48911](https://doi.org/10.1001/jamanetworkopen.2023.48911)

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