

# Autism screening rate soars with use of CHICA system

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Universal early screening for autism is recommended for all children but is not routinely performed. A new study from Regenstrief Institute and Indiana University School of Medicine researchers, published in *JAMA Network Open*, reports that the system they designed and developed called CHICA (short for Child Health Improvement through Computer Automation), increased the autism screening rate at 24 months of age from zero to 100 percent.

CHICA is a computerized decision support tool that can interface with any electronic health record (EHR) system. Responses to questions entered on a tablet computer by parents in the waiting room alert CHICA to produce personalized, evidence-based recommendations allowing the pediatrician to focus on what the specific patient really needs. CHICA may highlight the need for [screening](#) for [autism](#), depression, diabetes, tuberculosis, or anemia, counseling for the parents on smoking or on proper child car seat installation.

"The dramatic increase in autism screening by physicians during our trial was achieved because, with CHICA, we have completely automated the [screening process](#), potentially making a difference for so many children and their families," said Regenstrief Research Scientist Stephen Downs, M.D., Jean and Jerry Bepko Professor of Pediatrics at IU School of Medicine, who led the study and is the founder of CHICA. "We know that children on the [autism spectrum](#) can be identified as young as 18 months; with CHICA we can get them evaluated and enrolled in early intervention programs which could improve their lives and save society

millions, perhaps billions, of dollars."

The likelihood of benefit for a child who is referred for applied behavioral analysis (ABA) after an autism diagnosis decreases with age. Currently, the mean age of autism diagnosis for all children in the United States is four and a half years, more than two and a half years later than optimal, according to Dr. Downs.

"Autism rates do not vary by race or ethnicity, but autism is underdiagnosed or diagnosed later in life in underrepresented racial and ethnic minorities in the U.S," he said. "Automating the screening process as we did with CHICA avoids these kinds of biases and decreases health inequities." A majority of the children in the study were African American or Hispanic.

CHICA provides an action trigger, communicating with the child's EHR, analyzing the child's demographics, diagnoses and medications and then selecting the 20 highest-priority yes or no questions covering a wide range of primary care issues to ask the family in English or Spanish.

CHICA analyzes the responses to these questions, conducts a tailored health risk assessment and determines the six most important prompts for the physician. These are assembled into a patient's current visit agenda for the doctor and stored for future decision support.

CHICA also includes a library of handouts (autism, lead exposure, adolescent depression screening and infant car seat installation are among the topics covered) that can be printed as needed for dissemination to parents, based on the individualized issues of particular concern identified by CHICA.

There is still much more work to be done. The new study also found that while CHICA increased screening to 100 percent, the continuation of the

process, requiring a human (the physician) to follow through with a post-screening referral for diagnostic evaluation, turned out to be the weak link. In the study only slightly more than half (57 percent) of those children who screened positive for autism were referred for further evaluation.

Dr. Downs believes that automating the referral process through CHICA provides a solution to the low number of physician referrals for appropriate further evaluation. "We built CHICA to optimize care. We call it an 'everything system' because it has a universe of guidelines and is able to sort out which ones are of most value to the specific patient and prioritize these items," he said. "But CHICA could also automate the referral process for diagnostic evaluation so more young children with autism are identified and can get early ABA therapy that can result in significant increases in IQ, even into the normal range with improved likelihood of mainstreaming in school."

The Centers for Disease Control and Prevention (CDC) estimates prevalence of autism spectrum disorders in 2014 to be one in 59 eight-year-olds in the U.S. The American Academy of Pediatrics recommends that toddlers be routinely screened for autism during their 18- and 24-month doctor visits.

"Effect of a Computer-Based Decision Support Intervention on Autism Spectrum Disorder Screening in Pediatric Primary Care Clinics" is published in *JAMA Network Open*. The cluster randomized clinical trial was conducted in urban pediatric clinics to determine whether computer-automated screening and clinical decision support built into an existing EHR system improves autism screening rates.

Authors of the study, in addition to Dr. Downs, are Nerissa S. Bauer, M.D., MPH, formerly of IU School of Medicine and now with Axon Health Associates; Chandan Saha, Ph.D. and Susan Ofner, M.S., of IU

School of Medicine and Aaron E. Carroll, M.D., M.S. of Regenstrief Institute and IU School of Medicine. They note in the paper that, "Too often, there are insufficient resources available to make proper diagnoses of ASD and even fewer resources available to treat children with a diagnosis of ASD. Improving those factors will be necessary to improve the outlook of the many children in the United States who have ASD."

Provided by Regenstrief Institute

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