

NEWS

# Screening tool misidentifies autism in many toddlers

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A widely used screening test for autism is more accurate in children at 24 months of age than at 18 months, according to three new studies<sup>1,2,3</sup>. The results suggest that clinicians need a more finely tuned screen for children younger than 20 months.

Parents in the United States typically complete the Modified Checklist for Autism in Toddlers (M-CHAT) at their child's 18-month and 24-month visits to the pediatrician. They answer 'yes' or 'no' to 23 questions probing social, motor and language skills.

Clinicians are supposed to give a follow-up interview to families whose children score above a certain threshold. They refer children for diagnostic testing if that second test indicates the child may have autism.

Testing children at 18 months may give them a **head start on therapy**. But the new work suggests the M-CHAT isn't accurate at this age.

"I wouldn't say it should be abandoned altogether until something else has been well established. But it doesn't perform as well at 18 months, and an alternative should be sought," says **Raymond Sturner**, lead author on two of the studies and director of the Center for Promotion of Child Development through Primary Care in Baltimore.

The results are in line with those from a 2014 study showing that the M-CHAT identifies only **one-third of 18-month-olds** who are later diagnosed with autism.

However, the benefits of identifying some children with autism early outweigh the harm from falsely flagging others, says **Diana Robins**, who leads the Research Program in Early Detection and Intervention at the A.J. Drexel Autism Institute in Philadelphia. Robins helped develop the M-CHAT in the late 1990s but was not involved in the new work.

"Whenever your goal is to detect something at the earliest possible point of detection, you will probably have lower sensitivity and specificity," Robins says. (Sensitivity refers to the proportion of people correctly identified as having autism; specificity is the proportion correctly categorized as not having the condition.)

## Prediction problem:

Two of the new studies examined the M-CHAT's '**positive predictive value**' — that is, the likelihood that a positive result on the test is accurate. In one of them, researchers collected M-CHAT results from 5,071 toddlers, 341 of whom screened positive. Only 98 of the 341 families agreed to a follow-up interview and a diagnostic evaluation; of these, the initial questionnaire correctly flagged 39 of the children, or 40 percent, as having autism. Adding the follow-up boosted this number to 58 percent.

The findings, which appeared 31 July in the *Journal of Autism and Developmental Disorders*, highlight the importance of the follow-up interview, which clinicians sometimes skip, says Sturner, who led the work.

How well the M-CHAT and follow-up predict autism depends on the child's age. The screens accurately predicted 69 percent of autism cases in toddlers 20 months and older, but only 36 percent of toddlers younger than 20 months.

The second study, also led by Sturner, offers an explanation for the test's weakness at younger ages.

He and his colleagues looked at M-CHAT results from 73,564 toddlers aged 16 to 30 months. They found that children younger than 20 months are about 15 percent more likely to screen positive for autism than are children older than 20 months.

The researchers then sorted 16 of the M-CHAT questions into categories of skills that typically emerge before 8 months, at 12 months or around 15 months. They found that parents are less likely to say their 16- to 19-month-old children have acquired 15-month or 12-month skills, such as showing off toys and tracking others' gaze, than simpler 8-month skills.

This pattern suggests that the toddlers may either not yet have yet hit those developmental milestones or their parents don't recognize their skills just yet, Sturner says. Because of this, the M-CHAT may mistakenly flag these toddlers for autism. The team did not examine how many toddlers who screened positive later received an autism diagnosis.

## Specific screens:

In the third study, parents completed the M-CHAT for 19,297 toddlers who live in Malaysia. Of the 50 toddlers with autism, the M-CHAT flagged only 18 as at-risk for the condition. It also identified 20 others who do not have the condition as being at risk. (The study has an unusually low rate of positive screens at 0.2 percent, however.)

These findings also show differences across age groups. The positive predictive value of the M-CHAT for toddlers aged 20 months and younger was about 26 percent. The screen correctly predicted between 60 and 78 percent of autism cases for toddlers aged 21 to 36 months.

The studies suggest a need for autism screens with questions on skills toddlers are certain to have mastered by their age. "The implication is we don't want to use the same set of items and cutoff score necessarily for both age groups," says **So Hyun "Sophy" Kim**, assistant professor of psychology in clinical psychiatry at Weill Cornell Medical College, who was not involved in the research.

Sturner has begun testing alternate questionnaires in 300 children at 18 months of age. One of the questionnaires gives parents a wider range of response options than simply 'yes' or 'no,' which he says may provide a more complete picture of a child's abilities.

**REFERENCES:**

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