

2024 Summary of Advances Nominations

Table of Contents

Screening and Diagnosis	2
Biology.....	2
Genetic and Environmental Factors.....	6
Interventions.....	6
Services and Supports.....	6
Lifespan	8
Infrastructure and Prevalence	9

Screening and Diagnosis

1	CDC	<p style="text-align: center;"><u>Nominated article:</u></p> <p>Robinson Williams A, Amoakohene E, Maenner MJ, Zahorodny W, DiRienzo M, Grzybowski A, Hall-Lande J, Pas ET, Bakian AV, Lopez M, Patrick M, Shenouda J, Shaw KA. Community testing practices for autism within the autism and developmental disabilities monitoring network. <i>Paediatr Perinat Epidemiol.</i> 2024 Mar 26. [Read Abstract Here]</p> <p style="text-align: center;"><u>Justification from IACC member who nominated article:</u></p> <p>Autism spectrum disorder testing practices vary widely by site and differ by race and presence of co-occurring intellectual disability, suggesting opportunities to standardize and/or improve autism spectrum disorder identification practices.</p>
2	NIMH	<p style="text-align: center;"><u>Nominated article:</u></p> <p>Wieckowski AT, Ramsey RK, Coulter K, Eldeeb SY, Algur Y, Ryan V, Stahmer AC, Robins DL. Role of Primary Care Clinician Concern During Screening for Early Identification of Autism. <i>J Dev Behav Pediatr.</i> 2024 Apr 2. [Read Abstract Here]</p> <p style="text-align: center;"><u>Justification from IACC member who nominated article:</u></p> <p>Screening (using standardized measures to identify children for further evaluation) and surveillance (incorporating caregiver concerns, physician observations, and developmental history) are both recommended by the American Academy of Pediatrics (AAP) to promote early autism identification. Screening rates have increased in recent years, but previous data indicates that this has not translated to higher rates of autism evaluation referrals or attendance. This paper sought to evaluate the role of primary care clinicians (PCCs) in improving autism referral rates and evaluation attendance. Toddlers were screened for autism during primary care checkups (n=7,039). Results of this study indicated that the frequency of PCC-reported concerns did not differ between those who were required to note concerns before viewing screen results and those whose response was option, suggesting that PCCs report concerns for social development even when not required to do so. Importantly, this study also found that screening and surveillance together are essential for improving early identification, and children identified through both methods were more likely to have autism diagnoses than those identified by screening only. In addition, children identified by both screening and surveillance were more likely to attend an evaluation. The findings support the recommendations of the AAP that both screening and surveillance should be incorporated into well-child visits.</p>
<h2 style="margin: 0;">Biology</h2>		
3	NIMH	<p style="text-align: center;"><u>Nominated article:</u></p> <p>Fourie E, Lu SC, Delafield-Butt J, Rivera SM. Motor Control Adherence to the Two-thirds Power Law Differs in Autistic Development. <i>J Autism Dev Disord.</i> 2024 Jan 27. [Read Abstract Here]</p>

		<p style="text-align: center;"><u>Justification from IACC member who nominated article:</u></p> <p>Motor differences are highly prevalence in autistic individuals and can contribute to social communication difficulties, including language development, and difficulties with daily living activities. This study utilized a smart tablet activity to computationally characterize motor control by testing adherence to the two-thirds power law (2/3 PL), which captures a systematic covariation between velocity and curvature in motor execution. This law governs many forms of human movement, and the production of motion in adherence to this law seems to be an innate tendency and can be seen in newborns as young as 3 days old. Children aged 4-8 years old participated in this study, including 24 autistic children and 33 typically developing children. Participants drew and traced ovals on an iPad. Researchers extracted data from finger movements on the screen, and computed adherence to the 2/3 PL and other metrics of motor functioning. Measures of cognitive ability were also collected. In comparison to the typically developing group, the autistic group demonstrated greater differences in speed between curved and straight sections of movement, increased levels of acceleration and jerk, and greater intra- and inter-individual variability across several kinematic variables. Further, significant motor control development was observed in typically developing children, but not in those with autism. This study is the first to examine motor control adherence to the 2/3 PL in autistic children, revealing overall diminished motor control. This study offers a novel tool for computational characterization of the autism motor signature in children's development, demonstrating how smart tablet technology enables accessible assessment of children's motor performance in an objective, quantifiable and scalable manner.</p>
4	NIMH	<p style="text-align: center;"><u>Nominated article:</u></p> <p>Gerber AH, W Griffin J, M Keifer C, D Lerner M, C McPartland J. Social Anhedonia Accounts for Greater Variance in Internalizing Symptoms than Autism Symptoms in Autistic and Non-Autistic Youth. <i>J Autism Dev Disord.</i> 2024 Feb 10. [Read Abstract Here]</p> <p style="text-align: center;"><u>Justification from IACC member who nominated article:</u></p> <p>Social anhedonia is defined as reduced pleasure from social interaction. It has historically been associated with autism; however, very few studies have directly examined behavioral traits of social anhedonia in autistic youth. Researchers investigated rates of social anhedonia in autistic (N=155) compared to non-autistic (N=135) youth (ages 8 to 18) and the relative contributions of autism and social anhedonia traits to co-occurring mental health. This was the first study to tease out the relative importance of social anhedonia and autism traits in understanding psychiatric symptoms in autistic youth. Findings revealed higher rates of social anhedonia in autistic youth, with a positive association between age and severity of social anhedonia symptoms. Social anhedonia symptom severity was also strongly associated with depression and social anxiety. These results indicate that social anhedonia is an important transdiagnostic trait that plays a unique role</p>

		in understanding co-occurring depression and social anxiety in autistic youth.
5	NIMH	<p><u>Nominated article:</u> Tasnim A, Alkisar I, Hakim R, Turecek J, Abdelaziz A, Orefice LL, Ginty DD. The developmental timing of spinal touch processing alterations predicts behavioral changes in genetic mouse models of autism spectrum disorders. <i>Nat Neurosci</i>. 2024 Mar;27(3):484-496. [Read Abstract Here]</p> <p><u>Justification from IACC member who nominated article:</u> Altered somatosensory reactivity is frequently observed among individuals with autism. In this study, researchers report that although multiple mouse models of autism exhibit aberrant somatosensory behaviors in adulthood, some models exhibit altered tactile (touch) reactivity as early as embryonic development, whereas in others, altered reactivity emerges later in life. Additionally, tactile overreactivity during neonatal development is associated with anxiety-like behaviors and social behavior challenges in adulthood, whereas tactile overreactivity that emerges later in life is not. This research suggests that the location of circuit disruption dictates the timing of aberrant tactile behaviors, as altered feedback or presynaptic inhibition of peripheral mechanosensory neurons leads to abnormal tactile reactivity during neonatal development, whereas disruptions in feedforward inhibition in the spinal cord led to touch reactivity alterations that manifest later in life. This research suggests that the developmental timing of aberrant touch processing can predict the manifestation of autism-associated behaviors in mouse models, and differential timing of sensory disturbance onset may contribute to phenotypic diversity across individuals with autism.</p>
6	NIMH	<p><u>Nominated article:</u> Travers BG, Surgent O, Guerrero-Gonzalez J, Dean DC 3rd, Adluru N, Kecskemeti SR, Kirk GR, Alexander AL, Zhu J, Skaletski EC, Naik S, Duran M. Role of autonomic, nociceptive, and limbic brainstem nuclei in core autism features. <i>Autism Res</i>. 2024 Feb;17(2):266-279. [Read Abstract Here]</p> <p><u>Justification from IACC member who nominated article:</u> The brainstem reticular formation is a network of brainstem nuclei and neurons that act as an important integration and relay center for many vital brain functions necessary for survival. Although multiple theories have speculated about the brainstem reticular formation's involvement in autistic behaviors, the in vivo imaging of brainstem nuclei needed to test these theories has proven technologically challenging. Using methods to improve brainstem imaging in children, this study set out to examine the role of the autonomic, nociceptive, and limbic brainstem nuclei (brain structures that are involved in homeostatic functions, emotional responses, and response to pain or threats) in the autism features of 145 children (74 autistic children). Participants completed an assessment of core autism features and diffusion- and T1-weighted imaging optimized to improve brainstem images. Researchers found specific nuclei, most robustly the parvocellular reticular formation-alpha</p>

		(PCRtA) and to a lesser degree the lateral parabrachial nucleus (LPB) and ventral tegmental parabrachial pigmented complex (VTA-PBP), to be associated with autism features. The findings suggest that individual differences in pontine reticular formation nuclei contribute to the prominence of autistic features. Specifically, the PCRtA, a nucleus involved in mastication, digestion, and cardio-respiration in animal models, was associated with social communication in children, while the LPB, a pain-network nucleus, was associated with repetitive behaviors. These findings highlight the contributions of key autonomic brainstem nuclei to the expression of core autism features.
7	CDC	<p><u>Nominated article:</u> Wiggins LD, Overwyk K, Daniels J, Barger B, Crain H, Grzadzinski R, Moody E, Reynolds A, Reyes N, Rosenberg C, Rosenberg S, Pazol K. Risk factors and clinical correlates of sensory dysfunction in preschool children with and without autism spectrum disorder. <i>Autism Res.</i> 2024 Jan;17(1):162-171. [Read Abstract Here]</p> <p><u>Justification from IACC member who nominated article:</u> Findings support sensory dysfunction as a distinguishing symptom of ASD in preschool children and identify risk factors and clinical correlates to inform screening and treatment efforts in those with atypical development.</p>
8	NIMH	<p><u>Nominated article:</u> Wu D, Wolff JJ, Ravi S, Elison JT, Estes A, Paterson S, St John T, Abdi H, Moraglia LE, Piven J, Swanson MR; IBIS Network. Infants who develop autism show smaller inventories of deictic and symbolic gestures at 12 months of age. <i>Autism Res.</i> 2024 Jan 10. [Read Abstract Here]</p> <p><u>Justification from IACC member who nominated article:</u> Research suggests that early gesture use has important downstream impacts on developmental processes, such as language learning. However, autistic children are more likely to have challenges in their gestural development. This study collected data using a parent-report questionnaire called the MCDI-Words and Gestures at 12, 18, and 24 months of age. Results showed that high-likelihood infants who later met diagnostic criteria for ASD have attenuated gesture growth from 12 to 24 months for both deictic gestures (intentional communicative gestures such as showing, pointing, giving, and reaching) and symbolic gestures (advanced form of gesture, using hand movements or actions that represent abstract ideas, concepts, or emotions) when compared to high-likelihood infants who later did not meet criteria for ASD and low-likelihood infants who did not meet criteria for ASD. Other social communicative skills, like play behaviors and imitation, were also found to be impacted in young autistic children when compared to their non-autistic peers. Understanding early differences in social communication growth before a formal autism diagnosis can provide important insights for early intervention.</p>

Genetic and Environmental Factors

9	CDC	<p style="text-align: center;"><u>Nominated article:</u></p> <p>Harris ST, Schieve LA, Drews-Botsch C, DiGuseppi C, Tian LH, Soke GN, Bradley CB, Windham GC. Pregnancy Planning and its Association with Autism Spectrum Disorder: Findings from the Study to Explore Early Development. <i>Matern Child Health J.</i> 2024 Jan 10. [Read Abstract Here]</p> <p style="text-align: center;"><u>Justification from IACC member who nominated article:</u></p> <p>Pregnancy planning was inversely associated with ASD and ASD symptomatology in non-Hispanic White (NHW) mother-child pairs. Findings were not explained by several adverse maternal or perinatal health factors. The associations observed in NHW mother-child pairs did not extend to other race-ethnicity groups, for whom pregnancy planning was lower overall.</p>
10	NIMH	<p style="text-align: center;"><u>Nominated article:</u></p> <p>Hernández-Díaz S, Straub L, Bateman BT, Zhu Y, Mogun H, Wisner KL, Gray KJ, Lester B, McDougle CJ, DiCesare E, Pennell PB, Huybrechts KF. Risk of Autism after Prenatal Topiramate, Valproate, or Lamotrigine Exposure. <i>N Engl J Med.</i> 2024 Mar 21;390(12):1069-1079. [Read Abstract Here]</p> <p style="text-align: center;"><u>Justification from IACC member who nominated article:</u></p> <p>Maternal use of valproate, used to treat epilepsy and bipolar disorder, during pregnancy has been associated with an increased likelihood of neurodevelopmental disorders in children. Although most studies of other antiseizure medications have not shown increased likelihoods of these disorders, there are limited and conflicting data regarding the likelihood of autism associated with maternal use of topiramate (used to treat epilepsy and migraines). Researchers identified a population-based cohort of pregnant women and their children within two health care utilization databases in the United States, with data from 2000 through 2020. Exposure to specific antiseizure medications was defined based on prescription fills from gestational week 19 until delivery. Two other antiseizure medications were included in the study, lamotrigine and valproate. The findings suggest that the incidence of autism was higher among children prenatally exposed to the studied antiseizure medications than in the general population. However, after adjustment for indication and other confounders, the association was substantially attenuated for topiramate and lamotrigine, whereas an increased autism likelihood remained for valproate.</p>

Interventions

There were no nominations covering this topic from January - April 2024.

Services and Supports

11	NIMH	<p style="text-align: center;"><u>Nominated article:</u></p>
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		<p>Chambers N, de Vries PJ, Wetherby AM. Feasibility of the Autism Navigator® JumpStart to Coaching in Everyday Activities course in South Africa. <i>Autism</i>. 2024 Feb 8:13623613231223784. [Read Abstract Here]</p> <p>Justification from IACC member who nominated article: In low-resource settings, non-profit organizations play an essential role in providing services and support for families with young children with autism, including in Africa. However, non-profit organization service providers may not have access to quality training in proven intervention methods. Web-based or online courses may help to meet this need. In this study, researchers invited a group of specialist and non-specialist non-profit organization providers in South Africa to complete a web-based course, Autism Navigator® JumpStart to Coaching in Everyday Activities, a 20-h self-paced course that provides training in an evidence-based parent coaching intervention called Early Social Interaction. They evaluated acceptability, appropriateness, and feasibility of the training. Most providers rated the course highly feasible, acceptable, and appropriate stating that the course content was very valuable and helpful in equipping them to serve their families.</p>
12	CDC	<p>Nominated article: Pazol K, Tian LH, DiGuseppi C, Durkin MS, Fallin MD, Moody EJ, Nadler C, Powell PS, Reyes N, Robinson B, Ryerson AB, Thierry JM, Tinker SC, Wiggins LD, Yeargin-Allsopp M. Health and Education Services During the COVID-19 Pandemic Among Young Children with Autism Spectrum Disorder and Other Developmental Disabilities. <i>J Dev Behav Pediatr</i>. 2024 Jan 1;45(1):e31-e38. [Read Abstract Here]</p> <p>Justification from IACC member who nominated article: Minimizing service disruptions for all children and ensuring continuity of specialty care for children with ASD is essential for future public health emergencies. Children may need additional services to compensate for disruptions during the pandemic.</p>
13	NIMH	<p>Nominated article: Reaven J, Pickard K, Meyer AT, Hayutin L, Middleton C, Reyes NM, Tanda T, Stahmer A, Blakeley-Smith A, Boles RE. Implementing school-based cognitive behavior therapy for anxiety in students with autism or suspected autism via a train-the-trainer approach: Results from a clustered randomized trial. <i>Autism</i>. 2024 Feb;28(2):484-497. [Read Abstract Here]</p> <p>Justification from IACC member who nominated article: Providing mental health programs in schools may increase access to care for autistic youth with anxiety. The purpose of the study was to train interdisciplinary school providers to deliver school-based Facing Your Fears, a cognitive behavior therapy program for anxiety in autistic youth. Seventy-seven interdisciplinary school providers across 25 elementary/middle schools were trained by their colleagues and members of the research team (train-the-trainer approach). Eighty-one students with autism or suspected autism, ages 8-14 years, were randomly assigned to either Facing Your Fears or usual care. Students in Facing Your Fears showed significant reductions in anxiety compared to</p>

		students in usual care according to caregiver and student report. Other measures involved examining change in provider cognitive behavior therapy knowledge after training and determining how well interdisciplinary school providers were able to deliver Facing Your Fears. Results indicated that interdisciplinary school providers showed significant improvements in cognitive behavior therapy knowledge after training. Interdisciplinary school providers were able to deliver most of Facing Your Fears activities and with good quality.
14	NIMH	<p><u>Nominated article:</u> Shea L, Villodas ML, Ventimiglia J, Wilson AB, Cooper D. Foster Care Involvement Among Youth With Intellectual and Developmental Disabilities. <i>JAMA Pediatr.</i> 2024 Apr 1;178(4):384-390. [Read Abstract Here]</p> <p><u>Justification from IACC member who nominated article:</u> This study sought to produce a population-level analysis of youth with autism or intellectual and developmental disability (I/DD) in foster care that examines differences in rates of foster care involvement based on race, ethnicity, age, and sex. This study was a cross-sectional design and involved all individuals with I/DD 21 years and younger enrolled in Medicaid through foster care in 2016 for all 50 US states and Washington, DC. Youth with I/DD were grouped into diagnostic subgroups: autism only, intellectual disability only, or autism and ID. This study found that among youth with I/DD, including autism, Black youth and females faced higher risk for foster care involvement, and the likelihood of foster care involvement increased with age.</p>

Lifespan

15	CDC	<p><u>Nominated article:</u> Hughes MM, Pas ET, Durkin MS, DaWalt LS, Bilder DA, Bakian AV, Amoakohene E, Shaw KA, Patrick ME, Salinas A, DiRienzo M, Lopez M, Williams S, McArthur D, Hudson A, Ladd-Acosta CM, Schwenk YD, Baroud TM, Robinson Williams A, Washington A, Maenner MJ. Health Conditions, Education Services, and Transition Planning for Adolescents With Autism. <i>Pediatrics.</i> 2024 Apr 1;153(4):e2023063672. [Read Abstract Here]</p> <p><u>Justification from IACC member who nominated article:</u> Working with pediatric health and education providers, families, and adolescents with autism will be important to identify contributing factors and to focus efforts to reduce disparities in the supports and services adolescents with autism have access to and receive. CDC researchers identified disparities in the identification of cooccurring conditions and school-based IEP services, practices, and transition planning.</p>
16	NIMH	<p><u>Nominated article:</u> Pezzimenti F, Durrani E, Zheng S, Adams RE, Bishop SL, Taylor JL. Perspectives on Employer-Initiated Terminations Among Young Adults</p>

		<p>on the Autism Spectrum. <i>J Autism Dev Disord.</i> 2024 Apr;54(4):1332-1343. [Read Abstract Here]</p> <p>Justification from IACC member who nominated article: Job instability is high among autistic adults, with employer-initiated terminations a common reason for job loss. This study used qualitative methods to code reasons that autistic adults identified for their employer-initiated termination. From 315 autistic individuals ages 18-35 who completed an online survey, 29.5% reported having been terminated from a job. These individuals were asked about the reasons for their termination and responses were coded into thematic categories. Common reasons included work performance, social difficulties, attendance, and mental health challenges. Adults were more likely to attribute terminations to internal causes (related to the individual) than to external causes (environment-related). A good fit between workplace, individual preferences, skills, and abilities is likely key to promoting job continuity for autistic adults.</p>
17	CDC	<p>Nominated article: Pokoski OM, Crain H, DiGuseppi C, Furnier SM, Moody EJ, Nadler C, Pazol K, Sanders J, Wiggins LD, Durkin MS. Economic impacts of the COVID-19 pandemic on families of children with autism and other developmental disabilities. <i>Front Psychiatry.</i> 2024 Feb 14;15:1342504. [Read Abstract Here]</p> <p>Justification from IACC member who nominated article: Findings suggest that families of children with autism, families of lower socio-economic status, and families of racial and ethnic minority groups experienced fewer work flexibilities and greater financial distress during the pandemic. Future research can be used to assess if these impacts are sustained over time.</p>
Infrastructure and Prevalence		
18	CDC	<p>Nominated article: Furnier SM, Gangnon R, Daniels JL, Ellis Weismer S, Nadler C, Pazol K, Reyes NM, Rosenberg S, Rubenstein E, Wiggins LD, Yeargin-Allsopp M, Durkin MS. Racial and ethnic disparities in the co-occurrence of intellectual disability and autism: Impact of incorporating measures of adaptive functioning. <i>Autism Res.</i> 2024 Mar;17(3):650-667. [Read Abstract Here]</p> <p>Justification from IACC member who nominated article: Study provides evidence for the importance of considering adaptive behavior as well as socioeconomic disadvantage when describing racial and ethnic disparities in co-occurring ID in epidemiologic studies of autism.</p>