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Title: Early Identification of Autism Spectrum Disorder Before the Age of Three

Autism Spectrum Disorder (ASD) has altered the lives of many families and children in the United States (US). ASD is a developmental disability caused by differences in the brain. Some individuals with ASD have a known difference, such as a genetic condition, however, other causes of autism are not yet known. (Centers for Disease Control and Prevention [CDC], 2022). In the United States in 2018, it was reported that 1 in 44 children were estimated to have autism. ASD is more than 4 times more common among males than among females and occurs in all racial, ethnic, socioeconomic groups, and cultures worldwide (Maenner et al., 2021; Stevanovic et al., 2022). Common characteristics of ASD include difficulties with communication, social interaction, repetitive behaviors, flexibility, and sensory processing which are characteristics that may be evident in toddlerhood. ASD is often accompanied by emotional, behavioral, and neurodevelopmental difficulties and with (American Psychiatric Association [APA], 2013; Harris et al., 2014; Colvert et al., 2022; Mandy et al., 2022; Crane et al., 2015; Chiang & Gau, 2015). Research is documented that early identification and intervention support a positive developmental trajectory for children with ASD (Estes et al., 2015).

Although diagnoses of ASD have increased and occur in all racial, ethnic, and socioeconomic groups, research indicates that discrepancies exist that pose barriers to early identification, including inconsistent diagnoses among different groups leading to misdiagnoses and late diagnoses (Harris et al., 2014; Marlow et al., 2019; Mandy et al., 2022; Nguyen et al., 2021). For example, Hispanic children are less likely than children from other ethnic groups to receive an ASD diagnosis. They are consistently underrepresented in special education programming under the ASD diagnosis and the average age of diagnoses is 11% higher than for White children. Similarly, African American children receive diagnoses 1.4 years later than White children (Harris et al., 2014). Discrepancies also exist within diverse groups, whereas African Americans and Asian/Pacific Islanders are more than twice as likely to receive special

education services under the ASD eligibility category than Hispanic, Native Alaskan, or American Indian children (Harris et al., 2014). Delays have also been noted between when caregivers initially contact a healthcare professional regarding concerns and receiving a formal diagnosis of about 3-4 years (Crane et al., 2015). Additionally, a child's symptoms may not be perceived as a cause for concern by parents and caregivers, resulting in a later age of diagnosis (Nguyen et al., 2021).

Ultimately, the early indicators and features of ASD including impairments in social communication and interaction, restricted and repetitive behavior, interests, and activities may impact autistic individuals from early childhood through adolescence and into adulthood (Chiang & Gau, 2015; Colvert et al., 2022). To decrease discrepancies in diagnoses of ASD, strong evidence supports conducting developmental surveillance at all child health visits, screening for ASD at 18 and 24 months, and ongoing developmental surveillance through school age (Hyman et al., 2020; Nickel & Huang-Storms, 2017; Williams et al., 2009). Researchers affirm that diligent and accurate diagnoses coupled with appropriate interventions will result in an increase in positive, sustainable outcomes across the lifespan for autistic children (Young et al., 2020; Williams et al., 2009). To ensure timely and accurate identification of ASD, strong evidence supports the use of valid scales that can be easily performed by any healthcare provider and simplified scales for educators to report possible ASD symptoms (Al-Mazidi & Al-Ayadhi, 2021). Examples of valid scales include the Autism Diagnostic Observation Schedule (ADOS), Modified Checklist for Autism in Toddlers (M-CHAT), and Childhood Autism Rating Scale (CARS), all of which can be utilized by medical professionals to assess behaviors in young children and identify early indicators of ASD.

The CARS is a 15-item tool used to uniquely assess and evaluate symptoms of ASD and identify where a child falls within the spectrum (Chlebowski et al., 2010). The ADOS is a standardized assessment used with children as young as 12 months to evaluate communication, social interaction, play, and restricted and repetitive behaviors in children. Developed by Dr. Catherine Lord and her colleagues, the ADOS provides an opportunity to observe both symptoms and behaviors that are associated with ASD in a consistently across all clients, locations, and clinicians (Bastiaansen et al., 2010). The M-CHAT is a

screening tool specific to ASD. This type of assessment is intended for toddlers between the ages of 16-30 months and will screen for the risk of ASD. This screener asks parents/caregivers a series of 20 questions regarding their child's behavior and allows assessors to determine if further evaluation is needed (Robins et al., 2014).

According to the American Academy of Pediatrics (AAP), early identification of ASD is essential to ensure children can access evidence-based interventions that can help optimize long-term outcomes (Zwaigenbaum et al., 2015). Research indicates that symptoms of ASD can be diagnosed as young as 18 months of age, with signs evident as early as 9 months, however, most children are diagnosed at ages much later than that. Studies show that some infants may display symptoms of ASD within the 6-9 month period which include: “(1) unusual visual examination and fixations; (2) unusual repetitive patterns of objects exploration; (3) lack of intentional communicative gestures; (4) lack of age-appropriate phonemic development; (5) lack of coordinated gaze, affect, and voice in reciprocal social-communicative interactions; and (6) decreased eye contact, social interest, and engagement” (Rogers et al., 2014, p. 2982). Studies show that the 6 aforementioned traits observed in infants with ASD are more likely seen in infants whose degree of delay and atypicality is more severe when compared to infants with later onset of symptoms (Bryson et al., 2007; Rogers et al., 2014). This supports a need for early, accurate screenings of ASD to support infants and children who are at risk for developing symptoms that impact daily life and functioning. Earlier identification of ASD before the age of 2 would lead to earlier treatment, which may maximize results due to the “greater plasticity of younger neural systems and prevention of secondary effects due to environmental alterations in response to ASD symptoms” (Rogers et al., 2014, p. 2989). Additionally, early identification of ASD would offer children and their families access to early intervention services under IDEA Part C (Individuals with Disabilities Education Act [IDEA], 2017).

Early identification depends on the child, the family, and the services the family can access (Hyman et al., 2020; Harris et al., 2014; Webb et al., 2014; Crane et al., 2015). The most consistently reported best practice is the utilization of early, intensive intervention for young children who demonstrate social reciprocity vulnerabilities even before a formal diagnosis is received. Early intensive

interventions have been associated with placement in less restrictive educational settings, as well as gains in several areas including IQ, adaptive functioning, and language (McIntyre & Zemantic, 2016; Warren et al., 2011). Additionally, the timing and intensity of intervention may potentiate effects, thus setting the recommended frequency across 5 days per week for a minimum of 25 hours per week (McIntyre & Zemantic, 2016). To ensure children with disabilities receive the appropriate services as early as possible, early intervention services are federally mandated in the U.S. under the Individuals with Disabilities Education Act for all children with disabilities. This mandate also ensures services are available for all individuals with disabilities from birth until age 21 (McIntyre & Zemantic, 2016). Regardless of the mandate in place, variations in the nature of early intervention services and treatment guidelines for individuals with ASD lead to inconsistent access to and agreement on what constitutes early intervention services.

To support children who screen positive for ASD symptoms and developmental delays, referrals should be initiated immediately for diagnostic evaluation and early childhood intervention services. It is not recommended for screeners to wait for an ASD diagnostic evaluation to take place before referring to early intervention services (Hyman et al., 2020; Nickel & Huang-Storms, 2017). Best practices for accurate and comprehensive evaluations include a multidisciplinary team approach including occupational therapy, psychology, speech and language, physical therapy, and special education to fully assess cognitive, communication, motor, and adaptive skills functioning (Hyman et al., 2020; Nickel & Huang-Storms, 2017; Ellerbeck et al., 2015). Strong evidence supports the use of culturally and linguistically appropriate tools for evaluations and interpretation of results to ensure diverse backgrounds and cultures are represented accurately in the process. (Hyman et al., 2020; Nickel & Huang-Storms, 2017).

There are many different types of interventions, therapies, and approaches utilized to support children with ASD, each being effective in their own respective way. Interventions such as applied behavior analysis (ABA) and developmental, individual-difference, relationship-based/floortime

(DIR/floortime) are available to aid children in learning skills needed to participate in daily occupations and routines (Mercer, 2015).

Research indicates interventions based on the principles of ABA as having strong empirical evidence (Nickel & Huang-Storms, 2017; Lee & Zemantic, 2017; Al-Mazidi & Al-Ayadhi, 2021; Ellerbeck et al., 2015). ABA is based on the science of learning and behavior and is a one-on-one therapist-led approach with goals to increase positive behaviors and reduce behaviors that can be harmful or may interfere with learning (Mercer, 2015). This type of therapy is often used to help children acquire appropriate social, behavioral, and language skills they will need to navigate the world (Mercer, 2015).

The DIR/floortime approach is different when compared to ABA, as it is child-led, intrinsically motivating, and focuses on the child's interests, while simultaneously incorporating positive behavior modifications (Townsend, 2022). DIR/Floortime aims to meet children where they are developmentally to better understand each child's unique needs and build on their strengths (Townsend, 2022). DIR/floortime supports children reaching the 6 Functional Emotional Developmental Capacities (FEDCs): (1) self-regulation and interest in the world, (2) engaging and relating, (3) intentional and two-way communication, (4) complex communication and shared problem-solving, (5) using symbols and creating emotional ideas, and (6) logical thinking/building bridges between ideas (Townsend, 2022). DIR/Floortime is often praised for being a more customized approach, whereas ABA is historically a more formulaic approach (Townsend, J. (2022).

Children with ASD have a wide range of needs which, if left untreated, may have a lasting impact on occupational performance and participation throughout their lifetime. Ensuring clinicians are properly trained to screen infants and young children for ASD will certify accurate and timely diagnoses before the age of 2, leading to children identified as having ASD receiving the appropriate services to best support their needs. Additionally, families struggle to navigate the complex entities of interventions and services, often facing numerous obstacles when attempting to access services for their children. Due to the complexity and variety in the presentation of ASD, it can take months for a medical diagnosis to be received, leading to services being delayed. It is crucial for earlier and more frequent screenings for ASD

to become the new golden standard, as it will allow families to have access to a world full of opportunities to ensure appropriate and necessary support for their child's development.

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