



2017

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Mitchel Leers
University of North Dakota

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Recommended Citation

Leers, Mitchel, "Autism: Benefits and Outcomes of Early Diagnosis and Intervention" (2017). *Physician Assistant Scholarly Project Posters*. 43.

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Autism: Benefits and Outcomes of Early Diagnosis and Intervention

Mitchel Leers, PA-S, BS, RRT

Department of Physician Assistant Studies, University of North Dakota School of Medicine & Health Sciences

Grand Forks, ND 58202-9037



Abstract

- The purpose of this review was to determine the importance of early diagnosis and intervention during infancy, leading to significant outcomes which include improvements in communication skills, receptive language and social interaction in children with ASD.
- Nass et al., (2016) described ASD as a “heterogeneous group of biologically based, neurodevelopmental disorders characterized by impairments in two areas: deficits in social communication and social interactions and restricted plus repetitive patterns of behavior, interests, and activities”
- The findings showed that early diagnosis and referral to intervention makes a significant impact on children with ASD showing improvements in many areas of delay including receptive communication, adaptive behavior, social interactions, social approach, joint attention, and IQ.
- The finding found when applying early intervention children maintained the gains in all areas with no to minimal regression loss of skills after a two year follow-up.
- The findings indicated that most providers that incorporate screening tools into their practice are referring to early intervention centers and the children are starting intervention prior to official diagnosis
- The findings showed that most children are being diagnosed at appropriate ages ranging from 30-120 months.

Introduction

- Taylor et al. (2016) suggested that the key practitioners are ones in family practice settings whom are assessing and referring at risk children to be evaluated by a multidisciplinary team.
- Primary care practitioners should follow best practice guidelines and include one standardized objective assessment tool such as the M-CHAT screening tool.
- American Academy of Pediatric recommends screening for ASD during all well-child visits between the ages of 18-48 months for all children.
- Early diagnosis and intervention is not only beneficial to the child’s developmental growth, but also beneficial for the whole family.
- Taylor et al., (2016) said it perfectly, “It is well established that early intervention improves outcomes for children with ASD and that children who start intervention at a younger age make more improvements than children who start at an older age”

Statement of the Problem

- According to the CDC, the prevalence of ASD in 2016 is estimated to 1 in 64, an increase from 2007 which was 1 in 150. (CDC 2016)
- This increase in prevalence is due to the evolving diagnostic criteria prior to the publication of the Diagnostic and Statistical Manual for Mental Disorders, 5th edition (DSM-5).
- The major areas that show improvement with early intervention includes; receptive communication, adaptive behavior, social interactions, social approach, joint attention, and IQ.
- Without early intervention the outcome can be quite devastating and as adults he or she may not learn basic life skills to function in society.
- Buescher et al (2014) stated that the estimated US lifelong cost of treating an individual with autism is around 2.4 million dollars.

Research Question

- When should children with ASD be screened, diagnosed and referred for early intervention?
- Does early intervention improve developmental delays and improve long term outcomes in children with autism?

Literature Review

Early Identification of Autism in Children

- Daniels et al., (2014) found that the optimal screening age for autism is at 9, 18, and 30-month during well-child visits. Screening is important in these early months to delay missed opportunities to receive early diagnosis and intervention to improve developmental delays.
- Daniels et al., (2016) found during their peer-review literature search that the mean age of formal diagnosis was around 48 months.
- Zwaigenbaum et al., (2013) looked at both retrospective and prospective studies focusing on social communication, language, receptive interactions/behaviors, motor development, self-regulation, and cognitive development. Among the research, they found two patterns: early onset in which symptoms started at early childhood and regression onset. Home videos showed delays in body movements including head lag as early as 6 months and abnormal postural asymmetry in infants in a lying position as early as 5 months in the early onset groups. The regressive onset symptoms appeared following a period of typical development and then loss of skills in one or more areas were reported in 20-47% between the ages 19-21 months.
- Lemcke et al., (2013) found that at 6 months if the child had little or no interest in grabbing at things or throwing toys to the floor, this increased the likelihood of developing ASD. The highest predictor of ASD at 18 months was found that children did not try to make marks with color pencils, cannot drink from a cup without help, and cannot climb stairs without support. Developmental delays visible as early as 6 months and even more signs exuded at 18 months, supporting the AAP recommendation to screen for ASD starting at 18 months. Daniels et al., (2016) found that the majority of providers that included screening tools into their practice had >80% referral rates. Additionally, not all screening had been done during well-child visits. When they looked at why there is still a delay in diagnosis they found that there was a lack of provider awareness about screening tools.
- Monterio et al., (2016) found that 89% of children were already receiving some form of early intervention and/or private therapies before the official diagnosis and 67% of those children were more likely to receive a diagnosis of ASD. Those who were already receiving services by the time of evaluation were more likely to receive an ASD diagnosis (67%) than those who were not (44%; p=.001). This is reassuring as there is usually a long wait time for autism diagnosis clinics.

ASD red flags by age 2

- Regression
- “In his own world”
- Lack of showing, sharing interest or enjoyment
- Using the caregivers hands to obtain needs
- Repetitive movements with objects
- Lack of appropriate gaze
- Lack of response to name
- Unusual prosody/pitch of vocalizations
- Repetitive movements or posturing of body, OCD tendencies

TABLE 1 T1 to T4 IQ, Vineland Communication Domain Standard Score, and ADOS Autism Symptom Severity

Period Age, mo (M, SD)	IQ			Vineland Communication Domain Standard Score			Autism Symptom Severity		
	n	Mean (SD)	d	n	Mean (SD)	d	n	Mean (SD)	d
T1 (27.2, 2.8)	48	60.1 (11.3)	—	46	69.7 (9.6)	—	48	7.3 (2.2)	—
T2 (35.0, 2.3)	48	68.1 (19.6)	0.43 ^a	48	74.4 (12.4)	0.42 ^a	48	5.5 (2.6)	-0.75 ^a
T3 (41.1, 3.1)	48	67.6 (20.6)	-0.01	48	75.8 (16.1)	0.11	48	6.5 (2.3)	0.41 ^b
T4 (72.6, 17.5)	42	81.5 (24.4)	0.52 ^a	48	82.4 (20.4)	0.38 ^b	47	7.4 (2.0)	0.46 ^b
T1-T4 change	42	21.4 (22.3)	1.02 ^a	46	12.7 (19.4)	0.81 ^a	47	0.1 (2.5)	0.05

^a T2 reference.
^b P < .05.
^c P < .01.
^d P < .001.
 Lemcke, S., Juul, S., Pamer, E., Lauritsen, M., & Thorsen, P. (2013). Early Signs of Autism in Toddlers: A Follow-Up Study in the Danish National Birth Cohort. J Autism Dev Disord. 2013 (43), 2366-2375. doi: 10.1007/s10803-013-1785-z

Long-term outcomes after early interventions have been applied.

- Estes et al., (2015) found that children using the Early Start Denver Model (ESDM) and Community Bases Treatment (COM) maintained the gains in many areas including; IQ, adaptive behavior, autism symptoms, and challenging behaviors two years later and did not develop regression or loss of skills. Two of the children that were in the ESDM groups no longer met the criteria (OP) for ASD after the two year follow up. Both groups increased standardization intellectual ability scores at age 6, with the COM group (mean IQ 68.33 to 84.89 p=<0.001) improving even higher in the ESDM group (mean IQ 81.76 to 91.29 (p=<0.001).
- Masse et al., (2016) found that PCIT showed a reduction in behavior problems while still able to focus on the essential intervention in all three participants when compared to CDI. One of the participants mean score at baseline was 25.67% and when applying CDI improved to 36%, however when applying PDI there was a marked improvement with a mean of 60.88%. The mean compliance task score only improved at the 3 month follow up resulting in a mean score of 70, showing no regression in compliance tasks.
- Smith et al., (2015) found that when EIBI therapy was applied, the most drastic improvement demonstrated was by the use of the MSEL tool measuring cognitive function (IQ) with a mean score of 58.8 and SD 13.39 (49-20) at intake and 64.43 and SD 18.2 (-2.00-2.50 p<0.0001) at year 1. VABS tools that measured behavior severity showed a mean score of 62.68 and SD 9.02 (47-93) at intake and at year 1 the mean was 63.34 SD 11.76 (40-89 p=<0.0001). Both the MSEL and VABS showed little significance from year 1 to year 2, on the bright side both showed little to no regression in these areas; MSEL mean score 64.93 SD 18.01 (49-12 p<0.001) and VABS mean score 59.89 SD 14.65 (30-120 p<0.02) at year two.
- Landa et al., (2012) concluded more pronounced results between the start of the study and at the 6 month follow using ABA therapy. IQ scores at the 6 month follow up showed a significant improvement from a mean of 60% to 68% (95% CI: 3.4 to 12.8.) Although there was no significant improvements 12 months later with a mean IQ from 68% to 67%. (95% CI: 7.1 to 16.3) The overall mean improvement throughout the study in regards to IQ was 21.4% (95% CI: 14.7 to 24.5 p=<.001). For communication, there was a significant improvement from the start of the study to the 6 month follow up with a mean improvement of 69% to 74%(95% CI: 0.6 to 8.8) using the VABS tool, but showed little difference at 12 month follow up with a mean of 74% to 75%(95% CI:0.5 to 3.3). The overall mean improvement throughout the study was 12.7% in regards to communication skills (95% CI: 9.0 to 17.0 p=0.001).

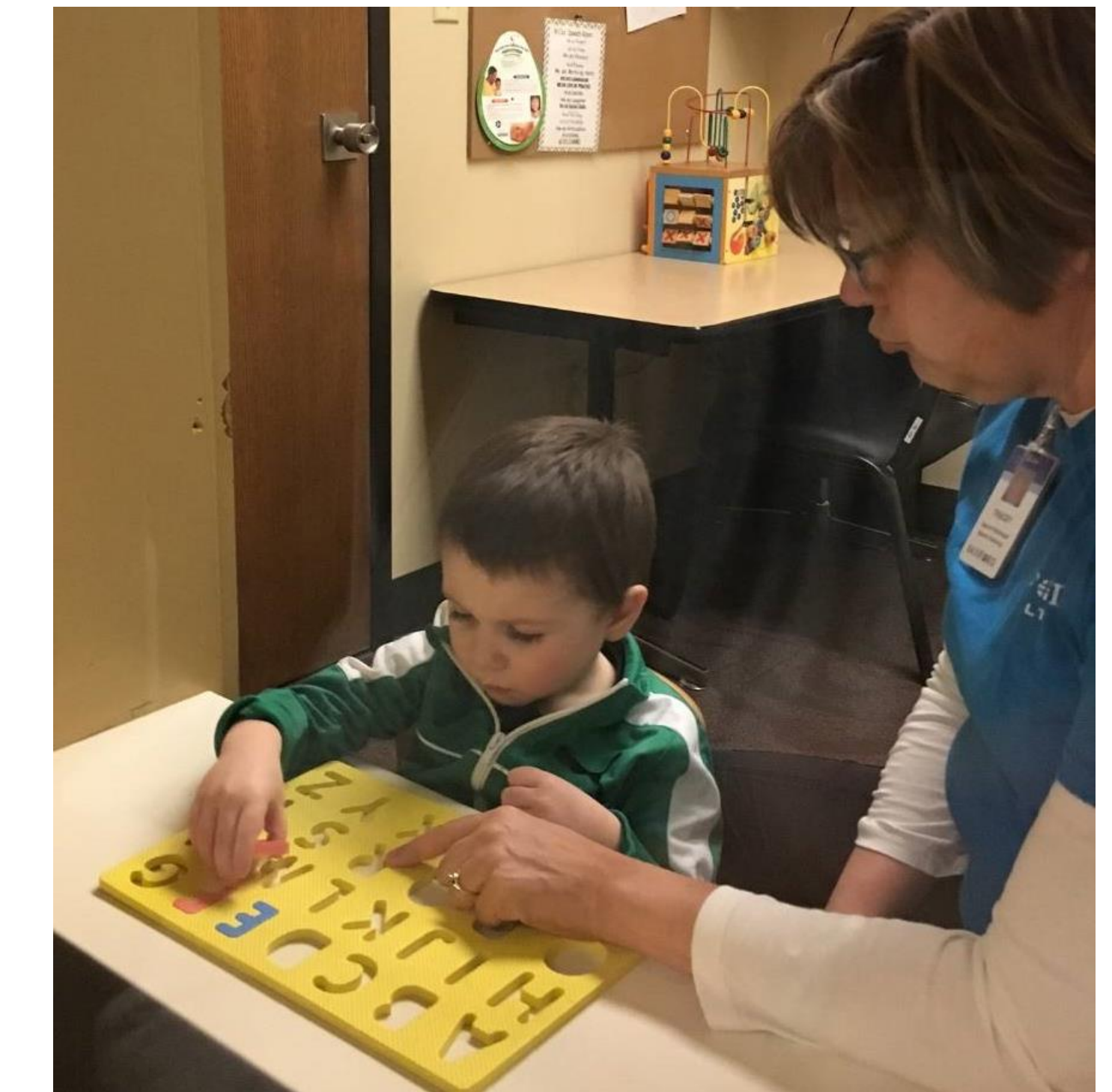
Discussion

- The current recommendations for screening set forth by the American Academy of Pediatricians and recognized as the gold standard for ASD is between 18-24 months during well child-visits.
- Symptoms or red flags will vary from child to child and may develop as early as 6 months in a small study.
- Not one study demonstrated the same signs and symptoms for a particular age showing that each child will manifest symptoms at different times. This further stresses the need for early detection during routine screening of these symptoms to give greater hope and therefore better outcomes when early intervention is started prior to a definitive diagnosis.
- Providers who incorporate some type of screening tool into their practice have shown to have >80% referral rate to early intervention.
- Children that were receiving therapy through the ESDM and the COM module maintained all their gains without regression in areas including intellectual ability, adaptive behavior, autism symptoms, and challenging behaviors at the two year follow up.
- PCIT is effective in reducing behavior and improving compliance task and did not show any regression in skills at the follow up time.
- Early intervention programs have shown to improve the child’s IQ as much as 21% when using ABA therapy.

- Early intervention has improved over the years to a point where some children are reaching OP and losing the ASD diagnosis with the initiation of therapies.

Applicability to Clinical Practice

- Primary care providers (PCPs) should have a working knowledge of ASD, but also be able to make a comprehensive assessment and know when to refer to early intervention. .
- It’s important for PCPs to be aware of the “red flags” associated with ASD and then appropriately screen these children in accordance with the American Academy of Pediatrics recommendation of starting at the age 18-48 months with regular developmental surveillance using the MCHAT screening tool.
- The MCHAT screening tool has shown to be 83% sensitive and 93% specific.
- It has been well researched that delayed referrals to intervention programs has shown a decrease in improvement post diagnosis, a reduction in positive outcomes, and a missed opportunity to potentially change the lives of these children and their families.



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Acknowledgements

I want to give a special thanks to Dr. Marylyn Klug and Jami Schwab MS, CCC-SLP for all they did in helping me write this scholarly project. Your help, time, and expertise are greatly appreciated. I also want to thank my son, Preston, who was diagnosed with autism spectrum disorder at 18 months for inspiring me to choose this topic for my project.