

## **Abstract 1**

### **Parent Developmental Concerns, Provider Response to Concerns, and Delays in Diagnosis for Children with Autism and other Developmental Disorders**

*Katharine E. Zuckerman, MD, MPH, Olivia Lindly, MPH, Brianna Sinche, MPH, Christina Bethell, PhD, MBA, MPH, Pediatrics, Oregon Health & Science University, Portland, OR*

**Purpose:** To assess whether age of initial parent developmental concern differs between children with autism spectrum disorder (ASD) vs other developmental conditions, and to assess whether provider response to initial parent concerns is associated with earlier diagnosis. **Methods:** Using data from the 2011 Survey of Pathways to Diagnosis and Services, we assessed parent concerns and diagnostic experiences in 1420 children with Autism Spectrum disorder (ASD) and 2579 children with intellectual disability or developmental delay (DD). We calculated child age at parent's first concerns, time between concerns and first conversation with a provider about concerns, and time between concerns and definitive developmental diagnosis. We used logistic regression to test the association between provider response to concerns, categorized as proactive (e.g. referred parent to a specialist) vs. reassuring/passive (e.g. said the child may "grow out of it") with experience of diagnostic delay more than 2 years. **Results:** Compared to children with DD, children with ASD had a significantly lower age of initial parent concern (2.12 vs 3.02 years;  $p < 0.001$ ) and initial discussion of concerns with a provider (2.33 vs 3.22 years;  $p < 0.001$ ). However, children with ASD were less likely than children with DD to have experienced 2 or more proactive provider responses to their concerns (AOR: 0.70[0.53-0.93]) and were more likely to have experienced 1 or more reassuring/passive responses (AOR: 1.48[1.13-1.95]). Among children with ASD, those with 2 or more proactive provider responses to parent developmental concerns had lower adjusted odds of a >2 year delay between discussion of concerns and ASD diagnosis (AOR: 0.45[0.30-0.68]). In contrast, children with 1 or more passive/reassuring provider responses had higher odds of this delay (AOR: 2.80[1.82-4.30]). **Conclusion:** Compared to children with DD, children with ASD are more likely to have early parental concerns, but are less likely to have proactive provider response to these concerns. Passive/reassuring provider responses were associated with diagnostic delays for children with ASD, highlighting the need for targeted quality improvement in pediatric primary care settings.

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## Abstract 2

### **The Rapid Interactive Test for Autism in Toddlers (RITA-T): a New Level 2 Autism Spectrum Disorder (ASD) Screening Test in Toddlers.**

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**Purpose:**To evaluate the RITA-T for use as a level 2 ASD screening in toddlers **Methods:**The RITA-T includes 9 items that evaluate social communication skills in toddlers, in 10 minutes. We have established its scoring algorithm, manual, and training protocol. We enrolled toddlers 12-36 months old who were (a) typically developing (TD) and (b) referred to developmental clinics for evaluation of a concern about developmental delays (DD) or ASD. The RITA-T was administered by a reliably trained research coordinator to toddlers in both subsamples. In the referred sample, clinicians administered the ADOS module 1, assessed the DSM 4 and DSM 5 criteria for ASD, and provided diagnoses (ASD or DD). All parents completed the MCHAT. We compared RITA-T scores in the TD, ASD and DD subsamples using the Kruskal-Wallis test. We investigated correlations among the total scores of the RITA-T, the ADOS, and the MCHAT. We also determined a cut off score for the RITA-T based on clinical diagnoses and ROC curves with the DSM 4 and DSM 5 results. **Results:**A total of 138 toddlers were enrolled: 77 had a diagnosis of ASD, 27 had a diagnosis of a DD (Global Developmental Delay in 8, Language Delay in 17 and Behavioral Disorder in 2); 34 were TD. RITA-T scores were significantly different in the three groups: ASD: mean 20.4 (SD 3.8); DD: mean 12.7 (2.8) and TD: mean 10.2 (2.4) ( $p < 0.0001$ ). The RITA-T total score strongly correlated with the MCHAT total score (Pearson correlation 0.66,  $p < 0.0001$ ) and with the ADOS (Pearson correlation 0.7,  $p < 0.0001$ ). Based on DSM 5 criteria a cut-off score of 18 has a Sensitivity of 74.2%, Specificity of 76.2% and PPV of 82.1% for ASD vs. DD. Using DSM 4 criteria, a cut-off score of 18 has Sensitivity of 72.9%, Specificity of 85.3%, PPV of 91.1%. **Conclusion:** The RITA-T is a good level 2 ASD screening test for toddlers: in 10 minutes it fits well into clinic flow, is easy to learn reliably, and has good discriminative properties. The RITA-T may also have value in monitoring response to treatment and this is being investigated.

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### **Abstract 3**

#### **Effectiveness of a Peer Model Education Curriculum in Training Peer Models to Teach Social Skills to Children with Autism Spectrum Disorders**

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**Purpose:** Social skills deficits are a hallmark feature of Autism Spectrum Disorders (ASD). The inclusion of typical peers to model positive behaviors has shown effectiveness in acquisition, maintenance, and generalization of social skills in group settings; however most of this research is with preschool age children. There is very little research regarding peer model curriculum content or teaching strategies. This study examined the relationship between the use of the Peer Model Education Curriculum (PMEC) and corresponding changes in targeted skills for school-aged peer models. **Methods:** Four peer models were taught the didactic component of the PMEC along with 3 behavioral skills to be used while engaging with the children with ASD. The three skills taught were: a) initiating verbal interaction, b) prompting for social skills, and c) praising use of social skills. The peer models were delivered feedback of performance, and provided with verbal cues for prompting and praising. The cues were systematically introduced and faded. The design was a single-subject research design utilizing a multiple baseline across behaviors. **Results:** For each behavior, there was limited response to the teaching intervention (TI) alone. However, much higher levels of behavior were observed when performance feedback (PF) was introduced. Initiating verbal interaction was seen in 12.8% of intervals during baseline, 12.6% TI, and 65.8% PF. Prompting of skills was observed in 0% intervals in baseline, 2.6% with TI, and 35.2% with PF. Praise was 0% in baseline, 5.2% with TI, and 12.8% with PF. Prompting and praising behaviors did not generalize to a new setting, though there were continued high levels of verbal interaction. Both returned to higher levels (17% for praise and prompt) with additional cuing and both continued with the fading of cues. On a 5 point Likert scale, the mean peer model social validity scores for effectiveness of training, enjoyment of training, and satisfaction with the program were 4.7, 4.3, and 4.7, respectively. **Conclusion:** This study showed that "train and hope" is not effective, but rather PF and prompting is needed to train peer models targeted skills that assist with social skills development in peers with ASD.

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## Abstract 4

### Prevalence of Autism Spectrum Disorders and Obsessive Compulsive Disorder in Males with Duchenne and Becker Muscular Dystrophies

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**Purpose:** This is a pilot study to assess the prevalence of Autism Spectrum Disorders (ASD) and Obsessive Compulsive Disorder (OCD) in the childhood onset Duchenne and Becker Muscular Dystrophy (DBMD) population in a statewide sample. **Methods:** Fifty-four males with DBMD (median age 12 years, range 3-22 years) were screened for ASD using the Social Communication Questionnaire (SCQ), and 44 of those participants (median age 14 years, range 6-22 years) were screened for OCD using the Yale-Brown Obsessive Compulsive Scale. A score of 11 or greater on the SCQ or a score of 16 or greater on the Y-BOCS qualified participants for complete diagnostic evaluation. ASD diagnostic evaluation included the Autism Diagnostic Interview, Revised and Autism Diagnostic Observation Schedule. OCD diagnostic evaluation involved a semi-structured interview with a child and adolescent psychiatrist. **Results:** Scores on the SCQ ranged from 0-24 with a median of 5 (25th-75th percentile: 2-9). SCQ scores were evenly distributed across age groups (Spearman correlation:  $r=0.03$ , 95%CI: -0.24 to 0.30,  $p=0.828$ ). Scores on the Y-BOCS ranged from 0 (26 participants) to 30 with a median score of 0 (25th to 75th percentile: 0-6). Y-BOCS scores rose with increasing age (Spearman correlation:  $r=0.30$ , 95%CI: 0.003 to 0.55,  $p=0.048$ ). 7 participants qualified for diagnostic testing for ASD. An ASD was diagnosed in 2 participants (3.7%, 95%CI: 0.4% to 12.8%). 6 participants qualified for diagnostic evaluation for OCD. OCD was diagnosed in 4 participants (9.1%, 95%CI: 2.5% to 21.7%). **Conclusion:** The reported frequency of symptoms indicating increased risk for an ASD did not change with age. The prevalence of ASD in DBMD in this study is similar to current general population rates in males. The number of OCD symptoms reported increased with age. The prevalence of OCD in DBMD in this study is elevated compared to general population rates, a finding that was suggested in one previous study. Prevalence of OCD should be further explored in a larger population of DBMD males. Confirmation of an elevated prevalence of OCD in DBMD could enhance early detection and symptom management.

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## **Abstract 5**

### **Parent Health Beliefs, Child Health Services Utilization, and Child Health Care Quality among US Children with Autism and other Developmental Disorders**

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**Purpose:** To examine variation in parent beliefs about disease prognosis and treatment and the association of parent health beliefs with child health services utilization and health care quality, among children with special health care needs having autism (CSHCN+ASD) vs CSHCN with other developmental disorders (intellectual disability and/or developmental delay; CSHCN+DD). **Methods:** We used data from the 2011 Survey of Pathways to Diagnosis and Services and the 2009/10 National Survey of Children with Special Health Care Needs to assess parent health beliefs, child health service utilization, and health care quality among 1420 CSHCN+ASD and 2579 CSHCN+DD. Using logistic regression, we compared beliefs about disease prognosis ("condition is permanent versus temporary") and treatment efficacy ("condition can be prevented or decreased with treatment") in CSHCN+ASD versus CSHCN+DD, and among socio-demographic subgroups of CSHCN+ASD. We also assessed whether parent beliefs were associated with differential child health care utilization or quality among CSHCN+ASD. **Results:** CSHCN+ASD were more likely than CSHCN+DD to have parents who believed the child's condition was lifelong rather than temporary (AOR: 1.83 [1.36-2.46]) or could be improved with treatment (AOR 1.82 [1.33-2.48]). Among CSHCN+ASD, those who were Hispanic or Black were less likely to have parents who believed that the condition was lifelong (AOR 0.36 [0.20-0.67]; AOR 0.31 [0.15-0.61]). Older age was associated with increased belief that the condition was lifelong and decreased belief that the condition improved with treatment. CSHCN+ASD whose parents believed treatment was effective were more likely to use psychotropic medications, but were also more likely to report difficulty accessing community-based services. **Conclusion:** CSHCN+ASD and CSHCN+DD had parents who held different beliefs about disease prognosis and treatment. Among CSHCN+ASD, socio-demographic factors accounted for further variation in parent beliefs. Beliefs about ASD treatment efficacy were associated with different patterns of health services utilization. Providers should ask parents about their health beliefs since these beliefs may impact services use and satisfaction.

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## **Abstract 6**

### **Deviant and Prosocial Peer Influence on Adolescent Suicidal Behavior**

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**Purpose:**Current research indicates that adolescents are significantly more susceptible to peer influence than adults and that this susceptibility may act as a predictor of risky behavior, substance use, and depression. However, the association between adolescent suicidal behavior and peer influence is still unclear. Thus, the purpose of this study was to examine the effects of deviant and prosocial peer influence on adolescent suicide attempts. **Methods:**Using the Peer Behavior Inventory (PBI), the authors examined the peer relationships of 40 adolescent suicide attempters, 13 to 18 years of age, and 40 never-suicidal, demographically matched psychiatric comparison subjects. **Results:**Of the four factors generated by the PBI, suicide attempters and comparison subjects differed significantly on two factors (prosocial behavior and suicidality). An independent-samples t-test was conducted; suicide attempters reported a significantly higher proportion of peers with suicidality (mean = .19, SD = .23 vs.  $.04 \pm .09$ ,  $t = 3.70$ ,  $df = 76$ ,  $p < .001$ ), a difference that persisted after controlling for psychotropic medication use. Conversely, attempters reported a significantly lower proportion of peer engagement in prosocial behavior (i.e., getting good grades, involvement in school clubs/teams, etc.) (mean = .66, SD = .23 vs.  $.78 \pm .21$ ,  $t = -2.40$ ,  $df = 75$ ,  $p = .019$ ), a difference that was attenuated after controlling for psychotropic medication use. **Conclusion:** Adolescent suicidal behavior is associated with exposure to suicidal peers. Future research should examine the temporal association between exposure to suicidal peers and risk of suicidal behaviors, and determine longitudinally if prosocial peer interaction is protective for youths at risk of suicidal behavior.

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## Abstract 7

### Medical Evaluation of Children with Intellectual Disability: Clinician Non-Compliance with Published Guidelines

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**Purpose:** Children with intellectual disability (CWID) are typically referred to developmental pediatricians (DP) and child neurologists (CN) for medical evaluation. Although the AAP and AAN have published evaluation guidelines, experience suggests DP and CN frequently order tests not recommended (i.e., EEG and MRI) and fail to order indicated tests (i.e., chromosomal microarray (CMA) and DNA for Fragile X (FraX)). Our goal was to assess the extent to which DP and CN follow published clinical guidelines for evaluating CWID. **Methods:** A 2-page questionnaire was mailed to all DP and CN in the US asking for demographic information and which specific laboratory tests they would "routinely order" for 3 hypothetical cases. This analysis focuses on the case of a 3½ year old boy with Full Scale IQ=58, and no seizures, lethargy, regression, dysmorphic features, vomiting or macrocephaly (height = 50%; head circumference = 90%). Chi square tests were performed to compare the two disciplines (CN vs DP). **Results:** 131 DP and 125 CN responded. Overall, only 18% DP and 2.4% CN complied with AAP and AAN guidelines respectively (DP>CN;  $\chi^2=16.11$ ;  $p<.0001$ ), and compliance did not differ with # years in practice ( $\leq 15$  vs  $\geq 16$  years;  $\chi^2=0.29$ ,  $p=0.59$ ). Although neither an EEG nor MRI are indicated in this case, 10% CN and 1.5% DP noted they would routinely order an EEG (CN>DP;  $\chi^2=9.13$ ,  $p=.002$ ) and 58% CN and 10% DP would routinely order an MRI (CN>DP;  $\chi^2=67.38$ ,  $p<.0001$ ). Although indicated, 30% CN and 24% DP would not routinely order CMA (DP~CN;  $\chi^2=1.47$ , n.s.), and 37% CN and 20% DP would not order FraX (CN>DP;  $\chi^2=9.09$ ,  $p=.003$ ). 2.3% DP and 6.4% CN would order an outdated karyotype without CMA ( $\chi^2=2.63$ , n.s.). Lead screening would be ordered by 44% DP and 33% CN (DP>CN;  $\chi^2=3.11$ , n.s.). CN practice setting did not influence EEG or MRI ordering. **Conclusion:** The overwhelming majority of CN & DP in a national sample fail to follow published clinical guidelines for lab evaluation of CWID. Relative to DP, CN are more likely to order inappropriate EEGs and MRIs, yet less likely to order recommended genetic tests (FraX and CMA) and metabolic tests (lead level).

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## Abstract 8

### The Concerns Of Parents at High Psychosocial Risk: Can Families in Crisis Identify Developmental-Behavioral Problems in Their Children and Follow Through with Referral Recommendations?

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**Purpose:**Background: 2-1-1 is a national call line serving annually 16 million families with non-emergent crises (e.g., eviction, food instability). 211 Los Angeles (211LA) receives ½ million calls per year and provides developmental-behavioral (DB) screening. Research questions include: Are families in crisis willing to spend time on DB screening? Do their children have elevated needs for health and DB services? How well do families follow through with referral recommendations? How do detection and follow-through rates compare to general pediatric samples? **Methods:** PEDS Online was used to support interview administrations of Parents' Evaluation of Developmental Status (PEDS), the Modified Checklist of Autism in Toddlers (MCHAT) and PEDS: Developmental Milestones (PEDS:DM). **Results:**70% of 211LA families (N = 3919) completed one or more screens on their children (mean age = 3 years). Of parents: 45% spoke Spanish; 52% lived in poverty; 37% were high school graduates; and 88% were minorities. 69% raised concerns on PEDS.60% performed below the 16th percentile in one or more domain on PEDS:DM. 16% failed the MCHAT. 211LA findings were compared to data on 8367 children seen in 12 general pediatric clinics in 6 US States. Family demographics were nationally representative: Spanish-speaking (12%); poverty levels (23%); high school graduation (78%); minorities (34%). Children of 211LA families were 4 times as likely to raise health or DB concerns [OR = 4.2 (CI = 2.21 !! 8.00)]. Children were twice as likely to have health problems or DB delays, and elevated risk for autism spectrum disorder [OR = 1.8 (CI =1.00 - 3.08); OR = 1.9 (CI = 0.81 - 4.59)]. 211LA referred (via live call transfers) all uninsured children and those with DB issues: 57% were successfully connected to SCHIP, Early Head Start, IDEA, etc. In contrast, referral uptake rates from general pediatric clinics (typically using non-live referral methods such as fax, voice-mail or email) is ~ 20% [OR = 5.3 (CI = 2.82 - 9.96), p < .0001]. **Conclusion:** Parents, even in the midst of domestic crises, are willing to discuss worries about their children. Such families have children with high rates of non-emergent health and DB problems and are willing to follow through with referral recommendations.

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## **Abstract 9**

### **National Trends in Psychotropic Medication Use in Very Young U.S. Children with Behavioral Disorders: 1994-2009**

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**Purpose:**To examine recent national trends in psychotropic prescriptions for very young children with behavioral disorders at U.S. outpatient medical visits. **Methods:**Data for 2-5 year old children (n=43,598) from the 1994-2009 National Ambulatory and National Hospital Ambulatory Medical Care Surveys was used to estimate the weighted percentage of visits with identified behavioral disorders (attention-deficit/hyperactivity, disruptive behavior, pervasive developmental, sleep, anxiety, mood, or adjustment disorders), and weighted percentage of visits with psychotropic prescriptions (psychostimulant, antipsychotic, antidepressant, anxiolytic, or antiadrenergic) in this group of children. Multivariable logistic regression was used to identify factors associated with behavioral disorders and psychotropic use. **Results:**Behavioral disorder rates in 2-5 year old outpatient visits increased from 1.24% in 1994-97 to 1.94% in 2006-09. When adjusted for age, sex, race, and insurance type, the likelihood of having an identified behavioral disorder increased by 55% over time (AOR for 2006-09 vs. 1994-97, 1.55 [95%CI 1.13-2.12]). Among visits with identified behavioral disorders, psychotropic usage rates declined from 43.3% in 1994-97 to 29.2% in 2006-09, as the likelihood of psychotropic use in 2006-09 was half that of 1994-97 (AOR for 2006-09 vs. 1994-97, 0.47[95%CI 0.26-0.85]). **Conclusion:** Despite rising rates of behavioral disorder identification, the likelihood of psychotropic use in very young U.S. children with behavioral disorders decreased from the mid-1990's to the late 2000's.

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## Abstract 10

### Diagnostic Assessment of Attention-Deficit/Hyperactivity Disorder (ADHD) by Developmental-Behavioral Pediatricians (DBP) at Academic Medical Centers: A DBPNet Study

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**Purpose:** Understanding clinical practice patterns is a prerequisite in developing practice guidelines for diagnosis of ADHD for DBP. We studied practice patterns in the 12 academic medical centers of DBPNet between 12/2011 and 6/2012. **Methods:** All DBPs who evaluate children with ADHD were asked to complete a one-page synopsis of demographic and clinical information for <11 consecutive new cases that resulted in the diagnosis of ADHD. Forms were analyzed using descriptive statistics. For age analyses, children were divided into young (Y<6yrs) vs old (O=or>6yrs). **Results:** 52 DBP returned =or>1 forms for a total of 208 diagnostic encounters (range 5-36/site, 1-10/DBP). Children were 76% male, 62% white, 24% African American, and 21% Hispanic. Mean child age was 8.4+3.1 yrs; 78% were in the old group. DBPs reviewed parent behavior-rating scales in 84.4% and teacher-rating scales in 69.2% of cases. DBPs reviewed or completed =or>1 developmental assessments in 79.8% of cases, including intelligence (61.1%) and academic tests (58.6%), or assessments of fine motor or visual-motor (39.4%), speech/language (35.1%), or adaptive skills (29.3%). Academic testing was more frequently reviewed or done in the old group (Y 41% vs O 64%; p=0.007) and motor assessments in the young group (Y 64% vs O 35%; p=0.019). 14.9% of the cases resulted in a provisional diagnosis; the proportion was higher in the young group (Y 30.4% vs O 10.5%; p<0.001). 82.7% of cases were diagnosed with >1 co-existing conditions, including learning disabilities (32.2%), speech/language disorders (32.2%), anxiety (14.2%), externalizing disorders (11.1%), and sleep disorders (9.1%). Difference in prevalence of co-existing condition by age was significant only for learning disabilities (Y 4.3% vs O 40.1%; p<0.001). Recommendations at the conclusion of the visit included counseling/behavior management (47.1%), further psychoeducational assessment (23.5%), and additional speech/language services (22.6%). **Conclusion:** Within DBPNet, DBP are highly likely to review parent- and teacher-rating scales, review or complete =or >1 developmental assessment, and identify =or >1 co-existing conditions in the initial diagnostic assessment of ADHD. They infrequently make the diagnosis of a co-existing externalizing disorder with the initial diagnosis.

## **Abstract 11**

### **Oppositional-Defiant Behavior is Associated with Anxiety in Preschoolers Referred for Developmental-Behavioral Evaluation**

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**Purpose:** To examine associations between anxiety and oppositional-defiant (OD) behavior in preschoolers including those with ADHD, ASD or neither diagnosis (ND). **Methods:** Data were collected retrospectively from parent and teacher forms of the Early Childhood Inventory-4 (ECI-Gadow & Sprafkin, 2009) for 193 3-6 year olds referred for developmental-behavioral pediatrics evaluation. From parent and teacher ratings, Total Anxiety (TA) and OD severity scores were calculated. Pearson correlations were computed between TA and OD. Backward elimination regressions were used to evaluate predictors of TA and OD. Candidate predictors were age, ADHD or ASD diagnosis, and parent and teacher TA and OD scores. Data were analyzed across all children and for ADHD (n=69), ASD (n=44) and ND (n=80) groups. **Results:** For all subjects, mean TA (6.08 vs 4.97;  $p=.05$ ) and OD (7.99 vs 6.08;  $p=.0012$ ) were both higher by parent than teacher report. Both parents and teachers reported the ASD subgroup as the most anxious (8.10/8.43) and the ADHD subgroup as the most OD (10.95/8.73). There was a strong correlation between parent reported anxiety and OD ( $r=0.43$ ;  $p<.0001$ ) and a weaker correlation between teacher reported anxiety and OD ( $r=0.18$ ;  $p=.018$ ). For diagnostic groups, these relationships remained significant only for parent ratings (ADHD  $r=0.31$ ,  $p=.021$ ; ASD  $r=0.56$ ,  $p<.0001$ ; ND  $r=0.59$ ,  $p<.0001$ ). Parent and teacher ratings of OD behavior agreed overall, but significantly only for the ADHD group ( $r=0.50$ ,  $p=.0002$ ). Regression analysis revealed that parent reported anxiety was the strongest positive predictor of parent reported OD ( $\beta=0.434$ ,  $p<.00001$ ) accounting for 21% of the variance. The strongest predictor of teacher reported OD behavior was ADHD ( $\beta=2.277$ ,  $p=0.0185$ ) accounting for 10% of the variance. **Conclusion:** Anxiety and OD behaviors are related in preschoolers, including those with ADHD or ASD, with the more OD children also manifesting greater anxiety. This relationship is stronger by parent than teacher report, suggesting parents may be more sensitive to the internalizing signs of anxiety. To some observers, acting out (externalizing) behavior may be the only evidence of a child's anxiety. For many OD preschoolers, therapy may be most effective if it targets anxiety.

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## **Abstract 12**

### **Improvement in Quality of Life in Overweight Hispanic Children upon Completion of a Stage III Weight Loss Program**

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**Purpose:** One in three children are overweight or obese, resulting in increased risk for developing chronic health problems such as fatty liver, diabetes, and heart disease (Ogden, C.L., Carroll, M.D., Curtin, L.R., 2006). Hispanic children are 1.30 times more likely to be overweight than non-Hispanic white children and are 40% less likely to engage in physical exercise (Department of Health and Human Services, 2012). The risks for poorer health and obesity related complications in Hispanic children are even greater than for other ethnic groups (Department of Health and Human Services, 2001). Hispanic youth are also at greater risk for poorer mental health outcomes, including lower quality of life (National Hispanic Caucus of State Legislators, 2010). The purpose of this study was to investigate how quality of life is impacted during weight management treatment for overweight Hispanic children. We hypothesized that weight management treatment and losing weight would improve quality of life as reported by children and their parents. **Methods:** Paired t-test analyses were utilized with the purpose of comparing quality of life upon initial clinic visit and again at 1 month post completion of the 10 week biweekly weight management program. **Results:** Results suggested that participation in a stage III weight loss program resulted in Hispanic children and their parents (N=12) reporting clinically significant improvements in quality of life regardless of weight loss. Specifically, parents indicated improved overall quality of life for their children  $t(11) = -4.07, p < .005$ , improved social functioning  $t(11) = -4.65, p < .005$ , and improved school functioning  $t(11) = -3.57, p < .005$ . Similarly, children reported clinically significant improvement in their own quality of life,  $t(11) = -2.26, p < .05$ , and rated near significant improvement in their own emotional and social functioning. **Conclusion:** The results of this study suggest that by focusing on weight management techniques, both children and their parents experience improved quality of life in numerous domains regardless of weight loss. This study has important implications for how weight management programs measure outcomes within this specialized population.

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## Abstract 13

### "How should I tell my child?": Disclosing the Diagnosis of Sex Chromosome Aneuploidies

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**Purpose:** The disclosure of a sex chromosome aneuploidy (SCA) diagnosis to an affected individual has not been explored to date. This study aimed to assess the timing and content revealed to an affected child by his or her parent(s), resources accessed in preparation, parental feelings of preparedness, common parental concerns, and recommendations for disclosure approaches. **Methods:** Two online surveys were created in REDCAP and links were distributed to organizations supporting individuals and families with SCA conditions: 1) for parents of a child with a diagnosis and 2) for individuals with a diagnosis. **Results:** 139 parent surveys (XXY n=68, XXX n=21, XYY n=9, other SCAs n=41) and 67 individual surveys (XXY n=58, XXX n=9) were analyzed. Parents most frequently discussed associated learning disabilities (47%) and genetics (45%) with their child during the initial disclosure. A significantly greater proportion of parent respondents reported feeling prepared vs. unprepared for disclosure, regardless of the diagnosis ( $z=-4.95, p<.00$ ). Both prepared and unprepared parents most frequently accessed websites, support groups, and discussion with the child's physician prior to disclosure, with unprepared parents accessing fewer resources than prepared parents (Mann Whitney U,  $p=.04$ ). Common parental concerns included making the conversation age-appropriate, discussing infertility, and possible impact on the child's self-esteem. Both parent and individual respondents endorsed honesty, disclosing the diagnosis early and before puberty, and discussing the diagnosis gradually over time. **Conclusion:** These results provide recommendations for parents, and suggest benefits from additional resources and supports to alleviate concerns when approaching diagnosis disclosure.

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## Abstract 14

### Gender Differences in Sexual Behavior and Contraceptive Practices and Perceptions in Adolescents and Young Adults with Congenital Heart Disease

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**Purpose:** Congenital heart disease (CHD) is prevalent, and individuals with CHD now survive into adulthood more than ever. The purpose of this study was to investigate gender differences within sexual risk taking. We determined the prevalence of sexual activity and effective contraception use among youth with CHD and compared these by gender to national and state data. Additionally, gender differences in family communication, perceived benefits and barriers, and self-efficacy regarding contraceptive use were also examined. **Methods:** 196 individuals with structural CHD, ages 15 to 25 (M = 19.0, SD = 3.2; 53.6% male; 84.7% white) were recruited from an outpatient cardiology clinic to participate in a larger study assessing genetic knowledge (85% consent rate). **Results:** 44.4% of participants reported having had sexual intercourse, and there was no significant difference based on gender (50% females, 40% males,  $p = .25$ ). Of sexually active participants, 81% reported using one or more effective methods of contraception at last intercourse (60% condoms, 43% hormonal methods) while 10% reported only using an ineffective method (i.e., withdrawal, rhythm) and 8.0% reported using no method. Rates of sexual activity were lower for both male and female adolescents than national and state data. More females (70%) than males (47%) indicated their parents had discussed how to avoid an unplanned pregnancy with them ( $p = .001$ ). While males were more concerned than females that using contraception would take too much time ( $p = .002$ ), there were no gender differences in participants' confidence in their ability to use contraception, which was high ( $p = .44$ ). **Conclusion:** The rates of sexual activity in this population suggest that the sexual development adolescents and young adults with CHD experience may lag behind their peers. Contraception use and self-efficacy were high for males and females with CHD. Additional research is needed to determine what other factors influence psychosexual development among youth with CHD.

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## **Abstract 15**

### **Transition of Health Care for Youth with Special Health Care Needs**

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**Purpose:**To assess the perception of pediatric providers regarding health care transition services from pediatric to adult health care for youth with special health care needs (YSHCN) and to identify barriers to transition. **Methods:**All general pediatric faculty and pediatric residents at the main outpatient clinic of a major academic center were invited to complete an online survey (the Health Care Transition Index for youth up to age 18; HCTI<18) developed by the National Health Care Transition Center (NHCTC). The HCTI<18 is a tool that measures observable indicators related to the organization and delivery of health care transition support for YSHCN. The HCTI<18 assesses the practice level in six transition themes: office policy, staff and provider knowledge and skills, identification of transitioning youth, preparation, planning and transfer of care, from Level 1 (lowest) to 4 (highest). Responders were also asked to rate barriers to transition from 1 to 10. **Results:**Responses were obtained from 18 residents and 15 faculty (49% and 62% response rate respectively). The modal response was level 1 for all themes, except for transition preparation, for which the level was 2. Deficits were particularly found in identification of transitioning youth, transition preparation and transition planning. The top three barriers to transition identified were time constraints (37.5%), insurance issues (37.5%) and difficulty finding an adult provider (18.8%). **Conclusion:** For most transition related themes, most respondents chose the lowest possible level (Level 1 or 2). Our findings demonstrate a clear need to improve health care transition services for YSHCN and identifies barriers to transition. Our next steps include a quality improvement intervention that utilizes an interdisciplinary collaborative team comprised of a pediatrician, social worker, nurse coordinator and community transition specialist in order to enhance care and reduce identified barriers to transition. This model, if effective, can then be disseminated to community settings in which pediatricians and primary care internists/family practitioners work in geographic proximity.

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## **Abstract 16**

### **Building Mental Wellness: a Learning Collaborative Approach to Improve Mental Health Promotion in Primary Care**

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**Purpose:** Emotional, behavioral, and developmental (EBD) issues are common in primary care. Data suggests children with EBD issues and their families are less well served than children with other special health care needs, and many pediatricians report inadequate training in this area. In order to improve the care for children with EBD issues, a learning collaborative was developed for use in the primary care setting. **Methods:** Twenty pediatric practices in Ohio were recruited to participate in a pilot program consisting of a 1½ day learning session and monthly phone conferences using the Institute for Healthcare Improvement modified breakthrough series format. Learning modules focused on five components of mental wellness: mental health promotion, screening and early identification, practice-based interventions, collaboration and community linkages, and evidenced-informed pharmacotherapy. **Results:** Practices reviewed a subset of charts for documentation of key aspects of mental health promotion in young children once a month over an 8 month period. One practice withdrew due to staffing issues. Documentation increased for all aspects studied: parental mental health (from 31 to 88%, n=14-91 charts), child tuned into to caregiver's emotions (from 29 to 58%, n=7-77 charts), verbally labeling emotions (from 0 to 88%, n=5-72 charts), and the use of time in and time out (0 to 78%, 5-79 charts). Challenges included staff time, staffing issues, and the difficulty of dissemination of information to all members of the practice. **Conclusion:** Based on this pilot study, a learning collaborative appears to be a feasible method to improve mental health promotion in the primary care setting. Barriers to completion were identified, and further study is needed to determine whether the pilot project can be disseminated. Future directions include a focus on patient outcomes associated with learning collaborative participation rather than documentation alone.

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## **Abstract 17**

### **Are we Missing the Real Problem?**

*Maria Theresa Villanos, MD, Marie Leiner, PhD, Jesus Peinado, MD, Cenani Antowan, MD, Pediatrics, Texas Tech University Health Sciences Center, El Paso, TX*

**Purpose:** It seems that pediatric populations from lower socioeconomic strata use fewer preventative services but more emergency services than their more economically and socially advantaged counterparts. However, the rate of use of preventative services among children from lower socioeconomic strata is not consistent but instead seems to follow an undefined pattern. Some pediatric patients from lower socioeconomic strata seem to have either a higher or a lower number of consultations per year for diseases that are not chronic (which could justify a high number of visits). Are patients with higher rates of consultation in need of a more comprehensive service that will cover psychosocial problems in addition to physical problems? Are we missing the real problem? **Methods:** Two hundred and sixty-three randomly selected children and adolescents ages 6 to 16 years attending three clinics responded to the Child Behavior Checklist (CBCL 6/18). The sample population included children and adolescents from lower socioeconomic strata without chronic or other serious clinical conditions. Their consultation records over a period of 2 years previous to the invitation to participate were reviewed retrospectively in order to determine the number of consultations (non-routine physical consultations). Rates of consultation were divided into three groups: 0-4 visits, 5-10 visits, and 11-18 visits in 2 years. **Measure:** The Child Behavior Checklist contains 120 behavioral and emotional problem items that are scored on a 3-level scale (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often true). **Statistical Analysis:** Logistic regression was used to calculate prevalence odds ratios (OR). **Results:** Children/adolescents with a large number of visits (11-18) have a significant increase in the odds of having psychosocial and behavioral problems (unadjusted OR = 3.0, (95%CI:1.1-8.3, p=0.03) when compared with their counterparts with fewer visits. After adjusting for age and gender, the OR remained highly significant at OR = 3.2 (95%CI:1.2-9.0, p=0.02). The results indicate an increase in the number of cases of children with psychosocial and behavioral problems as the number of visits increased from 0-4 (65/202, 32.2%) to 5-10 (42/64, 34.4%) to 11-18 (7/17, 58.9%). **Conclusion:** A larger number of consultations might predict conditions other than physical, including psychosocial and behavioral problems.

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## Abstract 18

### Potential Impact of ICD-10-CM on Developmental and Behavioral Pediatrics

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**Purpose:** The US government has mandated the transition to the International Classification of Disease (ICD) Tenth Revision, Clinical Modification (ICD-10-CM) on October 1, 2014. ICD-10-CM has 5 times the number of diagnosis codes as ICD-9-CM. To assist with the transition the government has released the General Equivalent Mappings (GEMs), linking ICD-9-CM to ICD-10-CM and the reverse. The benefit of GEMs is the mapping is government sponsored, only has two coding systems, and is free. Prior work using the science of networks, analyzed the GEMs mapping and categorized ICD-9-CM diagnosis codes for ease of transition. **Methods:** The list of ICD-9-CM codes from previously compiled CODES PERTINENT TO DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS were assigned to one of six categories. These categories have been developed by informaticians: identity (a single ICD-10-CM code replaces ICD-9-CM concept); class-to-subclass (multiple ICD-10-CM codes represent ICD-9-CM concept); subclass-to-class (multiple different ICD-9-CM codes map to single ICD-10-CM); redacted (ICD-9-CM codes that are not officially reimbursable codes); no mapping (no ICD-10-CM); and convoluted (a complex mapping between codes). **Results:** The 905 developmental behavioral diagnosis codes in ICD-9-CM were categorized by their transition to ICD-10-CM into identity 40%, class-to-subclass, 17%, subclass-to-class, 12%, redacted 14%, convoluted 17%, no mapping 0.2%. **Conclusion:** Transition ICD-10-CM is problematic for many common developmental diagnoses including autism spectrum disorders and ADHD. The current government mapping creates connections from ICD-9-CM to ICD-10-CM that are not clinically valid. While only 17% of the codes are convoluted, physicians will need to confirm that the mapping from ICD-9-CM conveys the diagnosis intended especially if coders or other personnel are assisting.

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## **Abstract 19**

### **Evolving Models of Co-Located Care between Pediatricians and Mental Health Clinicians**

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**Purpose:**To describe the models of co-located mental health care that have been developed by primary care pediatricians in Massachusetts, and summarize the financial, logistical, and interpersonal arrangements that support these successful collaborations. **Methods:**We conducted 30-minute semi-structured telephone interviews with 20 pediatricians in Massachusetts who have independently developed co-located practice models. We used NVivo software to analyze respondents' responses about the benefits/challenges of their models. **Results:**Practice types included single specialty and multi-specialty groups, community health centers, and academic clinics. The 18 practices represented employed a total of 27 mental health/developmental clinicians (MH/Ds): 12 social workers, 6 psychiatrists, 5 psychologists, 2 NPs and 2 developmental-behavioral pediatricians. Models of co-location varied widely. Approximately half of the practices employ providers who can prescribe medication. MH/Ds' other responsibilities include developmental and/or mental health evaluation, counseling, accessing social services, and facilitating external mental health referrals. While  $\frac{3}{4}$  of practices bill for the MH/Ds' services, few practices fully cover their costs through billing. The majority of practices utilize an EMR and in  $\frac{1}{2}$  of those practices, pediatricians have unrestricted access to the MH/Ds' notes. Pediatricians were universally enthusiastic about their practice models, citing improvements in access to care, communication among providers, coordination of care, physician workload, patient adherence, and referral procedures. The only frequently named challenges were financial and space concerns. **Conclusion:**Co-location of mental health providers in primary care settings facilitates access to pediatric mental health care and provides important benefits to both patients and physicians. In the context of health care reform innovations, pioneering pediatricians can provide a road map for pediatric practices attempting to implement similar models of care.

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## **Abstract 20**

### **Addressing Social Determinants in Primary Care and Residency Training**

*Ann Hazzard, PhD, Veda Johnson, MD, Terri McFadden-Garden, MD, Valerie Hutcherson, PhD, Pediatrics, Emory University, Atlanta, GA*

**Purpose:** Two pilot studies assessed the impact of the Urban Health Program (UHP), a comprehensive model of primary care for high-risk children in a residency training clinic. **Methods:** A Family Resource Survey assessing a wide range of family risks was implemented as a universal screener in the primary care clinic. We also developed a detailed protocol which guided providers to personnel or written resources for each identified risk. A Behavioral Health Coordinator (BHC) linked families to community mental health resources and an attorney with the Health and Law Partnership (HeLP) provided legal representation to address healthcare access, environmental safety or educational advocacy issues. Additional training on social determinants was added to the resident curriculum, including two core lectures and an elective. **Results:** For Study 1, a chart review was conducted with 350 charts, after a year of program implementation. We documented an 87% completion rate for the survey. The most commonly reported risk factors were inadequate income (19%), food insecurity (11%), maternal depression (7%), and housing problems (4%). For Study 2, a survey was administered to two resident classes at the beginning and end of their first year (n=29). Residents increased significantly in self-reported confidence about competently addressing: a) behavioral health (t=2.65, p<.05, Pre M=3.27, Post M=3.79), b) social determinants (t=3.31, p<.01, Pre M=3.29, Post M=3.79), and c) cross-cultural issues (t=5.55, p<.01, Pre M=3.40, Post M=3.76). They also increased in the number of patients for whom they made behavioral health referrals, from 16.5% at pretesting to 29.5% at post-testing (t=2.45, p<.05). **Conclusion:** Social determinants of health are strongly related to child developmental and behavioral problems, in addition to medical problems. There is increasing national emphasis on addressing social determinants, integrating behavioral health into primary care, and incorporating a public health perspective into resident training. The UHP represents an important step towards accomplishing these goals within an integrated clinical/training program.

## Abstract 21

### Who Is Referred for Developmental Evaluation When Parents Are Concerned?

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**Purpose:**To determine what factors contribute to referral for developmental specialty care and speech therapy after controlling for parent concern about development. **Methods:**This was a cross-sectional study using data from 0-5 year olds in the 2009 California Health Interview Survey. Primary outcomes were referral to a developmental specialist (RDS) and referral for speech, language or hearing testing (RSLHT). The Parents' Evaluation of Developmental Status assessed parent concern about development. Other explanatory variables included gender, age, birthweight, race, ethnicity, health insurance, and poverty level. We analyzed bivariate associations between each variable and the outcomes of RDS only, RSLHT only and a combined outcome of either RDS or RSLHT. We then constructed multivariable logistic regression models with these outcomes. Analyses were performed using R to accommodate for the complex sampling design. **Results:**The sample contained 3776 children. Referrals were common (RDS only 11.5%, s.e. = 0.83%, RSLHT only 15.0%, 1.1%, RDS or RSLHT 19.4%, 1.1%). In bivariate analysis, parent concern was significantly associated with RDS ( $p < 0.001$ ) and RSLHT ( $p < 0.001$ ). Age was associated with RSLHT ( $p < 0.001$ ) but not RDS. Parent concern ( $p < 0.001$ ), birthweight ( $p = 0.01$ ), lack of insurance ( $p = 0.04$ ) and age ( $p = 0.004$ ) were associated with the combined RDS/RSLHT outcome. In the multivariable models, parent concern (Odds ratios: RDS 4.9, RSLHT 4.2, both  $p < 0.001$ ) and birthweight (OR: RDS 0.64, RSLHT 0.70, both  $p < 0.001$ ) were independently associated with RDS only and RSLHT only. The combined outcome of RDS or RSLHT was associated with parent concern (OR 4.1,  $p < 0.001$ ), age (1.15,  $p < 0.01$ ), lack of insurance (0.39,  $p < 0.05$ ) and birthweight (0.63,  $p < 0.001$ ). Gender, race/ethnicity, and poverty were not associated with referral in any analysis **Conclusion:** After controlling for parent concern, increasing age, decreasing birthweight, and having health insurance were independently associated with RDS or RSLHT.

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## **Abstract 22**

### **Teachers Perceptions of Obese Children in the Classroom**

*Shana Wilson, MA, Aimee Smith, MA, Beth Wildman, PhD, Psychology, Kent State University, Kent, OH*

**Purpose:** Obesity in childhood has been associated with serious psychosocial consequences. Obese children are less socially accepted and are seen as more aggressive and disruptive by their peers in the classroom (Zeller, Reiter-Purtill, & Ramey, 2012). Research emphasizes the importance of teachers in fostering better peer relationships between students which leads to better social outcomes. However, research examining teacher perception of children with chronic illness has produced mixed results (Olson et al., 2004). This study sought to examine how teachers' views of obese children differ from their views of children with a less visible chronic illness (asthma). **Methods:** 140 teachers recruited via e-mail completed a questionnaire assessing attitudes toward children with health conditions. Participants were mostly female (88%) and have been teaching for more than 10 years (80%). **Results:** Repeated measures ANOVAs with Greenhouse-Geisser corrections found that teachers rated children with asthma as significantly more likely to be accepted by peers than obese children ( $p < .001$ ). Additionally, teachers reported obese children as more burdensome to have in their classroom than children with asthma ( $p < .01$ ). **Conclusion:** Teachers rated obese children as less socially accepted than their peers. Additionally, teachers see obese children as more of a burden than children with asthma. This finding suggests that the psychosocial consequences of pediatric obesity may be exacerbated by societal attitudes stemming from the visible nature of the condition. Based on teachers' important role in the social development of children, future research should be aimed at working with them to provide positive peer interactions for these children. Teachers should also continue to educate students on healthy living (e.g., exercise, healthy eating), as they are important facilitators of change.

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## Abstract 23

### The Relationship between Ethnic Identity Exploration and Psychosocial Functioning in African-American Adolescents with Chronic Illness

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**Purpose:** Ethnic identity exploration describes the process of discovering more about one's ethnic group and appears to be a necessary precursor to the development of ethnic or racial identity. In African-Americans, a strong racial identity has been associated with positive health outcomes, including better stress management and better mental health outcomes (Bediako et al., 2004; Pillay, 2005). Adults with Sickle Cell Disease (SCD) who endorse a strong and central African American identity utilize fewer health care services and report lower levels of sickle-cell related pain (Bediako, Lavender, & Yasin, 2007). Less is known about racial identity and health during the teen years, a critical time for development of racial identity (Baskin et al., 1998). This study examined the relationship between ethnic identity exploration and psychosocial functioning among adolescents with SCD. **Methods:** Participants were 15 African-American adolescents (M=14.5 years, SD=2.0; 67% female) with SCD, recruited from the Sickle Cell Clinic at Akron Children's Hospital. Participants completed the Multigroup Ethnic Identity Measure (MEIM), Strengths and Difficulties Questionnaire (SDQ), and Center for Epidemiologic Studies Depression Scale (CES-D). **Results:** Greater ethnic identity exploration predicted higher levels of depression on the CES-D,  $B=.74$ ,  $p<.01$  and higher levels of internalizing symptoms on the SDQ,  $B=.59$ ,  $p<.05$ . Ethnic identity exploration was not significantly related to the conduct problems, hyperactivity, peer problems, or prosocial scales of the SDQ. **Conclusion:** Adolescents who reported greater ethnic identity exploration reported greater levels of internalizing problems. These adolescents are still questioning their ethnic identity and have not yet made a commitment to an ethnic group. Future research is needed to understand the relationship between ethnic identity, internalizing problems, disease management, and health care utilization in adolescents with chronic illnesses. The results of our study suggest that health care providers should assess and consider racial identity as a contributor to internalizing problems in their adolescent patients and potential impact on disease management.

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## Abstract 24

### Pre-Reading and Reading Skills in Pre-term and Full-term 6-year old Children

*Vanessa N. Durand, AB, Katherine E. Travis, PhD, Heidi M. Feldman, MD, PhD, Pediatrics, Stanford School of Medicine, Palo Alto, CA*

**Purpose:** School-aged children and adolescents born preterm have been shown to have lower scores on intelligence, language, and reading measures than full term peers matched for age, gender and socioeconomic status (SES). The primary purpose of this study was to identify which cognitive, language, pre-reading and reading skills would differ between preterm (PT) and full term (FT) children at age 6 years, at the beginning stages of learning to read. We also wanted to establish whether prematurity contributed to the variance in pre-reading or reading outcomes. **Methods:** Children aged 6 years (PT n=28; FT n=15) were given a battery of intelligence (IQ), language, pre-reading, and reading assessments. We used student's t-tests to evaluate differences between PT and FT groups. We used regression models to determine whether IQ and language measures which survived a Bonferroni correction ( $p < .008$ ) and group (PT vs FT) were predictors of phonological awareness and phonological memory (pre-reading skills) and single word reading or decoding and comprehension (reading skills). **Results:** PT had lower mean scores than FT on IQ (PT 99.3 (12.0), FT=117.9 (17.0),  $p = .000$ ), core language (PT 103.0 (15.0), FT 113.6 (13.7),  $p = .035$ ), and phonological memory (PT 99.0 (11.3), FT 108.6 (13.7),  $p = .018$ ), but not on phonological awareness, decoding, or passage comprehension. Performance IQ (PIQ) and morphosyntax contributed to the variance in phonological awareness ( $R^2 = .375$ ,  $p < .000$ ), and morphosyntax only contributed to phonological memory ( $R^2 = .301$ ,  $p < .000$ ). PIQ and morphosyntax contributed to the variance in decoding ( $R^2 = .412$ ,  $p = .001$ ) and the same factors plus group contributed to the variance in passage comprehension ( $R^2 = .493$ ,  $p = .000$ ). **Conclusion:** PT children performed more poorly than FT on multiple intelligence, language, and pre-reading assessments. At this age, the children did not differ significantly on reading measures. This pattern of results may reflect the emphasis on teaching letter identification and sight word reading in kindergarten and first grade. The findings confirm the importance of language skills on early reading.

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## Abstract 25

### Parent versus Teacher Ratings of Core and Associated Behaviors of Autism Spectrum Disorder in Preschoolers

*Sarah Morgan, Undergraduate, Princeton University, Princeton, NJ, David Meryash, MD, Pediatrics, Cohen Children's Medical Center, Lake Success, NY*

**Purpose:** To compare parent and teacher (P-T) ratings of core autism symptom and various associated behavior clusters in preschoolers with or without Autism Spectrum Disorder (ASD). **Methods:** Data were collected from parent and teacher forms of the Early Childhood Inventory (ECI-Gadow & Sprafkin) for 201 3-6 year olds referred for DB pediatrics evaluation. From P-T ratings, severity scores were calculated for Total ASD symptoms, the three Diagnostic and Statistical Manual-4 (DSM) core ASD symptom clusters, and for 12 other DSM diagnosis-based symptom clusters. Data were analyzed across all children and for the 49 diagnosed as ASD. **Results:** For all subjects teacher mean severity ratings of ASD symptoms were higher than parents' for Total ASD (11.49 vs 9.73,  $p < .001$ ), Impaired Social (4.14 vs 2.87,  $p < .0001$ ), and Impaired Communication (4.54 vs 4.07,  $p < .01$ ), but not for Restricted Interests (2.81 vs 2.78). For the ASD group teacher ratings were higher only for Total ASD (19.30 vs 15.89,  $p = .02$ ) and Impaired Social (6.98 vs 4.71,  $p < .001$ ). For the full cohort, there were strong ( $p < .0001$ ) correlations between P-T reports for Total ASD ( $r = .51$ ), Impaired Social ( $r = .47$ ), Impaired Communication ( $r = .56$ ), and Restricted Interests ( $r = .41$ ). However, for the ASD group, P-T reports correlated for Total ASD ( $r = .34$ ,  $p = .013$ ) and Impaired Social ( $r = .52$ ,  $p < .001$ ), but not Impaired Communication or Restricted Interests. For associated behaviors, for all subjects, there was strong ( $p < .0001$ ) agreement between P-T reports for Combined ADHD ( $r = .36$ ), Inattention ( $r = .33$ ), Hyperactivity-Impulsivity ( $r = .42$ ), Oppositional-Defiant ( $r = .38$ ), and Generalized Anxiety ( $r = .39$ ), but not for Conduct Disorder, Peer Conflict, Specific Phobia, Obsessive-Compulsive, Tics, Depression, or Social Phobia. For the ASD group, P-T reports agreed only for Peer Conflict ( $r = .34$ ,  $p = .013$ ), and Generalized Anxiety ( $r = .47$ ,  $p < .001$ ). **Conclusion:** In a diverse preschooler sample, there was strong agreement between P-T report for many behaviors, including all ASD symptom clusters. For ASD children there was considerably less P-T agreement. Particularly, they did not agree on severity of Communication Impairment, Restricted interests, or ADHD symptoms. Possible explanations include different contexts and observer experience. Care is needed when using parent and teacher rating scales to assess children with ASD.

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## Abstract 26

### Symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in Kindergarten as Predictors of Academic Progress in Extremely Low Birth Weight Children

*Leah J. Orchinik, MA, Psychological Sciences, H. Gerry Taylor, PhD, Nori Minich, BA, Pediatrics, Case Western Reserve University, Cleveland, OH*

**Purpose:** The purpose of the current study was to examine symptoms of attention deficit hyperactivity disorder (ADHD) in kindergarten children as predictors of academic progress across the first three school years in a cohort of 148 extremely low birth weight (ELBW, <28 weeks gestational age or <1000 g) children and 107 term-born normal birth weight (NBW) classmate controls. **Methods:** Symptoms of ADHD (including combined, inattentive, and hyperactive-impulsive subtypes) were based on clinical interview with parents using the Children's Interview for Psychiatric Syndromes- Parent version. Achievement in reading, spelling, and mathematics was evaluated annually across the first three years in school on subtests of the Woodcock Johnson Tests of Achievement, 3rd Edition, using mixed model growth analyses. **Results:** Although the NBW group had higher scores on achievement tests, achievement was adversely affected in both groups. Across both birth weight groups, the presence of combined ADHD symptoms was associated with significantly slower progress in math word problems (Applied Problems,  $[F(1,250)=29.43, p<.0001]$ ). There was a significant interaction of group x time for spelling  $[F(1,226)=7.16, p=.008]$ , with ELBW children performing worse than NBW children across, but these results did not differ based on symptoms of ADHD. There were also significant interactions of symptoms x assessment for reading  $[F(1,229)=14.58, p=.0002]$  and math calculation  $[F(1,452)=6.31, p=.01]$ , with more ADHD symptoms resulting in worse performance across time in both groups. Finally, controlling for global cognitive ability, associations were more specific to the inattentive symptom counts. **Conclusion:** ELBW children with ADHD, like their NBW counterparts, have poorer academic skills in kindergarten and make slower progress across the early grades in school than those without ADHD. Children with symptoms of inattention are at risk regardless of their global cognitive ability. Identification of ADHD and related symptoms is important at school entry in targeting ELBW and NBW children in need of early educational interventions.

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## **Abstract 27**

### **Differential Response Profiles in Children and Adolescents with ADHD: Treatment with Atomoxetine**

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**Purpose:** Atomoxetine (ATX) has been shown to be safe and effective in the treatment of attention-deficit/hyperactivity disorder (ADHD). The purpose of this post-hoc analysis was to examine response trajectories of pediatric patients treated with ATX. **Methods:** Data were pooled from 7 ATX double-blind, placebo-controlled clinical trials conducted in pediatric patients between November 1998 and June 2004. Hyperactive/impulsive patients were excluded (due to small sample size). Growth mixed modeling was applied to investigator-rated ADHD rating scale (ADHDRS-Inv) and the Clinical Global Impression-ADHD-Severity (CGI-ADHD-S) scores in the randomized acute phase (6-9 weeks) to explore whether there were groups of patients who differed in their response to ATX. Baseline and the first 4 post-baseline visits were modeled quadratically, then linearly thereafter. To test for differences between identified trajectories, analysis of variance was used for continuous variables and Chi-square tests were used for categorical variables. Resultant classes were characterized by ADHDRS-Inv baseline scores (total score:  $\geq 40$ =high,  $< 40$ =low; subscores:  $\geq 20$ =high,  $< 20$ =low) and by improvement ( $\geq 40\%$ =robust,  $< 40\%$ =modest). **Results:** A total of 925 patients were identified who had at least 1 post-baseline measurement. Patients were mostly male (73%) and of the mixed subtype (74%). Based on ADHDRS-Inv total scores, 27% of patients had a low baseline score and experienced modest improvement, 18% had a high baseline and experienced robust improvement, and 55% had a high baseline score and experienced modest improvement. Similar results were found based on ADHDRS-Inv inattentive scores, but 34% experienced robust improvement. ADHDRS-Inv impulsive/hyperactive scores and CGI-ADHD-S scores yielded 2 classes, 1 that experienced robust improvement and 1 that experienced modest improvement. **Conclusion:** This study identified 2 to 3 distinct treatment response patterns in pediatric ADHD patients treated with ATX. Most patients were distributed in classes characterized by gradual, modest improvement, with a smaller class (more predominant when ADHDRS-Inv inattentive scores were used) characterized by early, robust improvement.

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## **Abstract 28**

### **Project BEST Developed Benchmark Indicators and Recommended Practices to Support Timely Identification, Referral, and Provision of Early Intervention Part C.**

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**Purpose:** Project BEST developed comprehensive benchmarks to evaluate timeliness and efficiency of Part C early intervention programs in terms of conducting screening, evaluation, and entry into services. These benchmarks provide targets as to what types of data indicators or practices can maximize a state's ability to identify, refer and ultimately improve access to EI/ECSE and were part of CDC's Act Early campaign. **Methods:** An environmental scan was conducted on selected state data systems, available literature, and expert report on effective practices early identification, screening and evaluation of infants and toddlers eligible for Part C early intervention services. Second, based on the environmental scan, a pilot version of benchmark indicators was developed. Third, a formative, mixed methods approach was used to evaluate, modify, and pilot test the initial benchmarks. Fourth, a final version of BEST Benchmarks was developed. **Results:** Benchmark #1. Universal Referral of Newborns and Children Automatically Eligible for Part C Services. All newborns and children with a diagnosed physical or mental condition that has a high probability of resulting in developmental delay, as defined by their state's eligibility categories under Part C of IDEA, will be referred to their local Part C provider. Benchmark #2. Universal Screening and Referral. Children between the ages of birth and five are screened at least once every 12 months, with valid and reliable screening tool(s) that screen for developmental and social-emotional delays. If a concern is identified, procedures are in place to ensure appropriate and timely referral to Part C, Part B or other agencies as indicated by screening results. Benchmark #3. Effective Identification of Underserved Populations. All children, regardless of race or risk factors (e.g., low-income, homelessness), will have equal opportunities to participate in Part C Early Intervention services. **Conclusion:** Early intervention services for infants and toddlers improve developmental, mental health, and health outcomes for young children and their families. State and local systems need to continue to improve efforts to identify eligible children to ensure that access to early intervention and early childhood special education services are equitable and timely.

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## **Abstract 29**

### **Young Children's Patterns of Aggression By Gender**

*Marie Leiner, PhD, Maria Theresa Villanos, MD, Jesus Peinado, MD, Pediatrics, Texas Tech University Health Sciences Center, El Paso, TX*

**Purpose:** To determine aggression patterns of children by gender at age 4-5 years and 1.5-3 years later from a retrospective review of medical records, including psychosocial/behavioral problems determined by the Child Behavior Checklist (CBCL). **Methods:** Participants for this study were selected at random from the electronic records of patients from seven university-based clinics in a large metropolitan area. Children and their parents/caretakers were surveyed during non-emergency visits while receiving regular pediatric care. A sample of 280 participants assessed twice at age 4-5 years (T1) and 1.5-3 years later (T2) were extracted. T-scores for factors from the CBCL above the 90th percentile were considered borderline/clinical on internalizing and externalizing scales. Logistic regression analysis was used to predict externalizing problems at T2 from internalizing and externalizing problems detected at T1. **Results:** The mean age of participants at T1 and T2 was  $4.8 \pm 0.6$  and  $7.0 \pm 0.7$  years, respectively. Boys comprised 40.7% (114) of the sample. Internalizing problems in girls (33.3%) and boys (20%) and externalizing problems in girls (41.7%) and boys (50%) prevailed from T1 to T2. Logistic regression analysis indicated that internalizing problems at T1 significantly predicted internalizing problems at T2 for both boys and girls, but was non-significant after adjusting for externalizing problems and gender. Externalizing problems at T1 also predicted externalizing problems at T2, which remained significant after adjusting for internalizing problems and gender. **Conclusion:** This study indicates that approximately half of children with borderline/clinical externalizing problems at an early age will continue with these behaviors at an older age. Parents should be aware that these behavior patterns might continue and may not be a temporary age-specific behavior.

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## **Abstract 30**

### **Screening for ASD in School Aged Children: A SUCCESS Story**

*Laura A. Carpenter, PhD, Catherine C. Bradley, PhD, Pediatrics, Amy Wahlquist, MS, Public Health Sciences, Jane Charles, MD, Walter Jenner, MS, Pediatrics, Sarah Logan, MS, Joyce Nicholas, PhD, Public Health Sciences, Katie Pietris, MA, Lydia B. King, PhD, Pediatrics, Medical University of South Carolina, Charleston, SC*

**Purpose:** The South Carolina Children's Educational Surveillance Study (SUCCESS) is an ongoing research study that will determine the prevalence of Autism Spectrum Disorder (ASD) among a population of 8,500 children born in 2004. Although prior research has established the prevalence of ASD using administrative data and record review, SUCCESS is the first large-scale study in the United States to utilize direct screening and assessment of ASD in a population based study. **Methods:** Through agreements with public schools, private schools, and home school associations, the Social Communication Questionnaire (SCQ) is distributed to parents of eligible children. Children who are found to be at risk for ASD, as well as a sample of those at moderate or low risk, are invited to participate in an in-person diagnostic assessment to determine ASD prevalence. **Results:** Rate of participation in the screening phase for the first three waves (out of six planned waves) of the study varied by school and ranged from 22%-100%. Strategies that were successful in increasing participation in the screening phase of the study will be described. In the first three waves of the SUCCESS study (n = 1292), results indicate that 7.7% of youth fell in the at-risk range for ASD on the SCQ (SCQ >14). Males were more likely to score in the risk range than females ( $\chi^2(1) = 10.0, p < 0.01$ ). It has been suggested in prior research that high-functioning youth with ASD may fall below the standard cut-off scores for the SCQ, and in this sample almost 20% of youth fell just below the cut-off criteria ( $7 < \text{SCQ} < 15$ ). **Conclusion:** Future data collection will focus on completing the remaining screening and diagnostic evaluations in order to establish the prevalence of ASD in the study area, compare DSM-IV and DSM-5 diagnoses, and determine the sensitivity and specificity of the SCQ as a screening instrument for ASD in population-based samples.

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## Abstract 31

### Comparing the Diagnostic Outcome of Autism Spectrum Disorder using Concurrently Collected DSM-IV-TR and Proposed DSM-5 Criteria

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**Purpose:** To determine the level of agreement between autism spectrum disorder (ASD) diagnoses made by concurrent administration of both DSM-IV-TR and proposed DSM-5 criteria. **Methods:** Subjects were children (ages 1-18 years old) referred for a multidisciplinary team (Psychologist, Developmental-Behavioral Pediatrician) consultation for developmental/behavioral concerns from October 2012 to April 2013. Consensus ratings were made for whether an ASD diagnosis was considered; if ASD was considered, clinicians completed checklists of DSM-IV-TR and DSM-5 criteria. Subjects for whom ASD was not considered were excluded. Cohen's kappa coefficient, sensitivity and specificity were used to determine level of agreement between DSM-IV-TR and proposed DSM-5 ASD diagnoses. **Results:** ASD was considered in 158 subjects. Of these, 106 subjects (67.1%) met DSM-IV-TR criteria for ASD (Autistic Disorder, PDD-NOS or Asperger's Disorder) and 64 subjects (40.8%) met DSM-5 criteria. Using Cohen's Kappa we determined that there was moderate (50.8%) agreement between the DSM-IV-TR and DSM-5 (95% CI: 39.6%-62.1%). The sensitivity of the DSM-5, calculated as the proportion of subjects who met ASD criteria under both DSM-IV-TR and DSM-5, was 60.95%. The specificity of DSM-5, calculated as the proportion of subjects who did not meet ASD criteria under either DSM-IV-TR or DSM-5, was 100%. We stratified subjects based on DSM-IV-TR sub-type: 84% with Autistic Disorder, 26% with PDD-NOS, and 60% with Asperger's Disorder met criteria for a DSM-5 ASD diagnosis. Excluding subjects with PDD-NOS, there was substantial agreement between the DSM-IV-TR and the DSM-5 beyond that expected by chance (79.9%; 95% CI: 69.5%-90.4%). DSM-5 sensitivity increased to 81.82%, and specificity remained at 100%. **Conclusion:** In a multi-disciplinary clinic setting, there is moderate agreement between DSM-IV-TR and DSM-5 ASD criteria, with highest agreement for DSM-IV-TR Autistic Disorder. Relatively low sensitivity of DSM-5 may exclude many children from an ASD diagnosis.

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## **Abstract 32**

### **The Parent-Child Play of Children**

#### **with Autism Spectrum Disorder, Speech/Language Impairment, and ADHD**

#### **: Implications for Parenting, Assessment, and Intervention**

*Maia M. Noeder, MA, Elizabeth J. Short, PhD, Rachael D. Cooper, MA, Clinical Psychology, Case Western Reserve University, Cleveland, OH*

**Purpose:** Through parent-child play, young children find an outlet for the development of key problem solving, fantasy, creativity, linguistic, affective, and social skills. For children with developmental disabilities, observations of parent-child play provide a window into a child's specific developmental strengths and weaknesses as well as the parent-child relationship. **Methods:** This study examined differences in the parent-child play of 76 children who are diagnosed with Autism Spectrum Disorder, Speech/Language Impairment, and ADHD. Comparison was made on a sample of parent-child play using the Affect in Play Scale-Preschool Version and the Parent-Child Play Scale (PCPS). **Results:** Diagnostic group differences were obtained for all play quality variables, with the ASD group having significantly poorer play quality than other groups (minimum  $F(3,34)=2.40$ ,  $p<.05$ ). Although condition effects were obtained for the majority of play variables (minimum  $F(1,34)=5.60$ ,  $p<.05$ ), these were complicated by the presence of a condition by diagnostic group interaction (minimum  $F(3,34)=2.74$ ,  $p<.05$ ). Parents uniformly facilitated play of children in the ASD and typical groups, with the ASD group benefiting the most. Parents were less effective in facilitating the organization and pretend play of children in the SLI group and the imagination of children in the ADHD group. A series of linear regressions were conducted to assess the predictive power of PCPS factors, fluid intelligence, and diagnostic group as predictors of independent and parent-child play characteristics. ASD group membership (minimum  $B = -1.8$ ,  $SE = .57$ ,  $p = .003$ ) and negative parent temperament (minimum  $B = -.40$ ,  $SE = .19$ ,  $p = .04$ ) were found to be consistent predictors of children's play scores during independent play. In contrast, fluid intelligence, diagnostic group, and parent factors were not found to be significant predictors of children's play scores during parent-child play. **Conclusion:** The intervention and assessment implications of these findings will be discussed with special attention paid to the strategies that parents can use to facilitate the play skills of young children.

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### **Abstract 33**

#### **Outcome of High versus Low Intensity Reading Intervention in Middle-School Children with Dyslexia**

*Danielle Raines, PsyD, Julie Wilson, PhD, Psychiatry and Human Behavior, Viren A. D'Sa, MD, Pediatrics, Warren Alpert Medical School of Brown University, Pawtucket, RI*

**Purpose:** Dyslexia is the most common cause of reading, writing, and spelling difficulties and accounts for the largest group of students in special education. However, less than 1/3 of these students receive academic services. **Methods:** In this pilot investigation, we compared the impact of empirically based high intensity (n=13) versus low intensity (n=10) reading intervention administered during elementary school to current reading performance in middle school for individuals previously diagnosed with dyslexia based on administration of the Gray Oral Reading Test, Fourth Edition. Intensity of reading intervention was determined by type of intervention received (i.e., empirically-based or non-empirically-based) as well as number of days per week the intervention took place. A frequency of greater than or equal to three days per week was conceptualized as high intensity, while anything less was considered low intensity. **Results:** Within-groups comparisons on the Gray Oral Reading Test-Fourth Edition showed that adolescents who received the empirically-based, higher intensity, intervention demonstrated significant improvements in reading rate, accuracy, and fluency ( $P < .03$ ). In contrast, adolescents who received the lower intensity intervention showed significant improvement in rate only ( $p = .04$ ); changes in accuracy and fluency were not significant. **Conclusion:** These findings suggest the benefit of participation in an empirically-based, or higher intensity, reading intervention for improvement of reading rate, accuracy, and fluency. Data collection is ongoing in order to establish the sizes of the between-group effect (empirically-based vs. low-intensity interventions). Overall, results emphasize the maintenance of gains in both reading rate and accuracy into middle school for adolescents previously diagnosed with dyslexia who received an empirically-based intervention.

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## **Abstract 34**

### **Care Coordination for Children with Autism Spectrum Disorder**

*Sarah A. Sobotka, MD, MSCP, Amy Francis, DO, Developmental and Behavioral Pediatrics, Karin Vander Ploeg Booth,, Pediatrics, The University of Chicago, Chicago, IL*

**Purpose:**Children with autism spectrum disorder (ASD) benefit from multiple interdisciplinary services, akin to other medically complex conditions. Primary care physicians report a lack of self-perceived competency, a desire for education, and a need for improvement in primary care for children with autism. The 2009-2010 National Survey of Children with Special Health Care Needs (NS-CSHCN) examines factors related to access to quality healthcare, care coordination, and medical homes. Care coordination is necessary to ensure quality health outcomes, and research from national databases of children with autism is limited. The purpose is to describe current trends in medical home access and perceptions of care coordination for a subset of families with children with autism in the NS-CSHCN. Data will be analyzed within the context of the Care Model for Child Health. **Methods:**Using a subset of the NS-CSHCN of children with ASD (N=3055), predictors of the following main outcome variables were analyzed via descriptive statistics and logistic regression: having a medical home, primary care provider (PCP), and satisfaction with care coordination and communication with other doctors and interdisciplinary care providers. **Results:**Children were of mean age 10.1 years, 80.7% male, 72% Caucasian, 7% Non-Hispanic Black, 11% Hispanic, and 20% supported by social security insurance. Respondents were 74% mothers; 16% had education level of high school or less. 94% reported having a medical home, and 94% had a PCP. 28% reported problems with referrals to other doctors. 16% of parents were dissatisfied with PCP communication with other doctors. 42% of parents reported that PCPs did not communicate with schools, early intervention (EI), childcare providers, or rehabilitation programs. 45% of parents reported never receiving as much help coordinating care as they needed. **Conclusion:** Parents of children with autism utilize a multi-disciplinary care team involving clinical and community partners. Although parents report a high level of access to primary providers and a medical home, care coordination activities, particularly communication with schools and EI, are lacking and for this vulnerable population. Medical home models may lack central care coordination components for families of children with ASDs.

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## **Abstract 35**

### **Telescoping Health Disparities in Childhood Autism: African American Families Providing Protection and Taking Action**

*Karen W. Burkett, PhD, Developmental and Behavioral Pediatrics,  
Cincinnati Children's Medical Center, Cincinnati, OH*

**Purpose:** Delays to the diagnosis of autism in African American children represent a substantial health care disparity in the United States, resulting in unnecessary impediments to early treatment. Cultural factors have been implicated in the disparities in care. The purpose of this study was to discover the cultural care meanings and practices of urban African American families caring for their child with autism. **Methods:** An ethnographic qualitative study was conducted to discover and systematically analyze meanings of care and cultural ways of urban African American families caring for their child with autism. Fifty two participants were interviewed and field observations conducted that included 8 African American families with 24 family members of children with autism, and 28 professional participants. Data were analyzed and findings reported as they emerged from the patterns as themes. **Results:** Two major culture care themes of providing protection and taking action for their child, underpinned by an additional finding of cultural pain were significant to the health care disparities in diagnosis among African American children with autism. The urban families provided protection by ensuring their child's independence in self care and building up trustworthy supports, and took action for their child in order to ease the stigma of autism and alleviate the cultural pain. **Conclusion:** The findings substantiated that cultural factors can influence the delays to diagnosis in the urban African American child with autism by impacting the child's phenotypical presentation, clinician bias toward diagnosis of the European American child, access to health care for the African American child and cultural knowledge of autism within the African American community. When clinicians provide culturally congruent care for African American families caring for their child with autism, there is the potential to mitigate some of the disparities in the health care of childhood autism.

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## **Abstract 36**

### **Premature Infant Growth Plotting: Failure to Adjust for Gestational Age and its Impact on Parental Perception of Infant Growth**

*Jaeah Chung, MD, Janet Lee, BS, Developmental and Behavioral Pediatrics, Cohen Children's Medical Center of NY, Lake Success, NY, Regina Spinazzola, MD, Pediatrics, Cohen Children's Medical Center of NY, Manhasset, NY, Lisa M. Rosen, ScM, Biostatistics, The Feinstein Institute for Medical Research, Manhasset, NY, Ruth Milanaik, DO, Developmental and Behavioral Pediatrics, Cohen Children's Medical Center of NY, Lake Success, NY*

**Purpose:** Growth patterns of preterm infants differ considerably from those of term infants with normal birth weights. The CDC recommends that gestation-adjusted age be used to plot a child's growth until 24 months of age. The purpose of this study is to compare parental perception of preterm infant growth between parents who were informed of gestation-adjusted age growth plots (GAGP) by their primary pediatrician (PCP) and those who were not. **Methods:** Parents of premature infants (3.5!! -24 month olds, chronologic age) were shown their infant's gestation-adjusted growth plots (GAGP) at NICU follow-up visits. They were then asked to complete a questionnaire about their impressions of their child's growth. Specifically, parents were asked if, at their most recent PCP visit, they were informed about their child's growth percentiles and if these percentiles were based on GAGP. Parents then rated how they felt about their child's growth after the PCP visit and at the NICU follow-up using the Andrews & Withey's Delighted-Terrible Scale (a published 7-point self-report measure of satisfaction). Data analyses were performed using the Wilcoxon rank-sum test and Chi-Square/Fisher's exact test, significance at  $p < 0.05$ . **Results:** 76 parents completed the questionnaire. 72.6% of parents reported they were informed of GAGP by their PCP. 27.4% of parents reported they were not informed. Parental satisfaction of infant growth was significantly associated with whether they were informed of GAGP at their PCP visit ( $P < 0.0022$ ). That is, parents informed of GAGP were more satisfied with their infant's growth than parents not informed of GAGP at their PCP visit. No significant association was present between informing of GAGP at the PCP visit and satisfaction of infant growth at the NICU follow-up, when parents were shown their infant's GAGP ( $P < 0.2857$ ). There was a significant association between informing parents of GAGP at the initial PCP visit, and a change in satisfaction between the PCP visit and NICU follow-up ( $P < 0.0004$ ). That is, parents who were not informed of GAGP had a greater increase in satisfaction between the PCP visit and the NICU follow-up as compared to parents who were not informed of GAGP. **Conclusion:** Contrary to CDC recommendations, 27.4% of pediatricians did not inform parents about

GAGP. This was associated with significantly lower parent satisfaction of infant growth.

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### **Abstract 37**

#### **Early Introduction of Solid Foods to Premature Infants and Impact on Feeding Behaviors and Parental Perception**

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**Purpose:** AAP recommends infants advance to solid food at 6 months and preterm infants advance when developmentally ready. Studies have shown that preterm infants who start solids early are more likely to have feeding difficulties. In this study, we examine the importance of assessing for developmental readiness when introducing solid foods to premature infants and its impact on infant feeding behaviors and parental perception of infant feeding patterns. **Methods:** Parents of premature infants completed the Feeding Behavior Questionnaire (FBQ, modified from DeMauro et al) at NICU follow-up. The FBQ focused on demographics, developmental readiness, feeding avoidant behaviors, and parental perception of infant feeding patterns. Data was analyzed using Chi-Square test and Fisher's exact test. **Results:** Of 70/76 subjects analyzed, 33 were "developmentally ready" (DR) (no problems with head/neck control, sitting with support, sucking, swallowing and/or choking) and 37 were "not developmentally ready" (NDR). The average gestation-adjusted age for introduction of solids was  $3.90 \pm 2.09$  months. There was a significant association between DR and NDR infants in the following food avoidant behaviors: pushing food away ( $P < 0.0045$ ), gagging ( $P < 0.0001$ ), holding food in mouth ( $P < 0.0059$ ), and crying ( $P < 0.0048$ ). Leaning back had borderline significance ( $P < 0.0519$ ). Turning head ( $P < 0.2715$ ), closing mouth ( $P < 0.3689$ ), and spitting ( $P < 0.9328$ ) were not significant. Parents of DR infants were more satisfied with their infants' eating habits as compared to parents of NDR infants ( $P < 0.0056$ ). Parents of DR infants reported feeling more comfortable, and less stressed during feeding times than parents of NDR infants ( $P < 0.0066$ ;

P<0.0400). DR infants were reported to have better appetites as compared to that of NDR infants (P<0.0019). There was no significant association between excessive feeding times and DR infants (11.76%) as compared to NDR infants (29.73%) (P<0.0640). There was no significant association between DR and NDR infants in respect to whether the infant was feeding enough when first introduced to solid foods (Fisher's exact, P<0.1387), or whether the infant was seen by a specialty clinic/feeding specialist due to feeding difficulties (Fisher's exact, P<0.1103). **Conclusion:** Pediatricians need to assess developmental readiness when considering introduction of solid foods for premature infants.

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### **Abstract 38**

#### **School Support for US Children with Autism Spectrum Disorder or Other Developmental Conditions: Associations with Socio-Demographic Factors, Health Services Utilization and Quality**

*Olivia Lindly, MPH, Brianna Sinche, MPH, Katharine E. Zuckerman, MD, MPH, Pediatrics, Oregon Health & Science University, Portland, OR*

**Purpose:** To examine the association of receipt of basic school support services with socio-demographic factors, health services utilization and health care quality, among US children having autism spectrum disorder (ASD) or developmental delay/intellectual disability (DD/ID). **Methods:** Data were drawn from the 2011 Survey of Pathways to Diagnosis and Services, which was linked to the 2009/10 National Survey of Children with Special Health Care Needs (CSHCN). Data were weighted to represent the non-institutionalized population of US CSHCN ages 6 to 17 years ever diagnosed with ASD versus DD/ID. The sample included 1420 CSHCN with ASD (CSHCN+ASD) and 2579 CSHCN with DD and/or ID (CSHCN+DD/ID). Basic school support was defined as receipt of early intervention services, an individualized education plan (IEP) which addressed parental concerns, and routine receipt of 1 or more school-based health services. Univariate, bivariate and multivariate analyses were conducted with the SPSS Complex Samples module. **Results:** 27.5% of CSHCN with developmental conditions received basic school support. Though bivariate analyses showed CSHCN+ASD were more likely to have basic school support than CSHCN+DD/ID, these associations were no longer significant after adjusting for socio-demographic factors. CSHCN with functional limits, who were younger, or had dual public/private insurance were most likely to receive basic school support. Among all CSHCN with developmental conditions, the

receipt of all needed developmental services was associated with school support (AOR:3.00[2.01-4.46]) as was adequate health insurance coverage (AOR:1.54[1.14-2.07]). **Conclusion:** Less than 1 in 3 CSHCN with developmental conditions receives a basic level of school support. Older CSHCN and those without functional limitations may be particularly likely lack basic school support. Associations between school support and health care quality reinforce the need for integrated, multi-disciplinary improvements.

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### **Abstract 39**

#### **Socioeconomic Disparities in Autism Screening in Pediatric Primary Care**

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**Purpose:**To better understand socioeconomic disparities in screening for autism spectrum disorders (ASDs), this study examined the outcomes of each step of screening in primary care clinics using the Modified Checklist for Autism in Toddlers (M-CHAT) and a recent revision (M-CHAT-R). **Methods:**The screening study involved up to three steps: 1) completion of the M-CHAT(-R) at an 18- or 24-month well child visit, 2) completion of a Follow-Up Interview (FUI) by telephone for families who initially screened positive, to clarify at-risk responses, and 3) participation in a full evaluation for children still at-risk for an ASD after the FUI. Initially, 11,845 families completed the M-CHAT(-R). At Step 1, 991 families screened positive, of whom 787 completed the FUI. Of the 225 families who were still at-risk, 150 completed the evaluation. Maternal education was used as a proxy for SES to examine differences in outcome at each step of screening. **Results:**Chi-square analyses indicated that children whose mothers had less education were more likely to initially screen positive ( $\text{ChiSq}(4,11,845)=232.7, p<.001$ ). For example, 21.5% of children of mothers with less than a high school education failed the initial screening, in comparison to 5.7% whose parents had graduate degrees. At the FUI, children of more educated mothers were more likely to continue to screen positive ( $\text{ChiSq}(4,787)=16.9, p=.002$ ). At evaluation, maternal education was not significantly related to diagnostic outcome. The impact of SES on participation in each step of screening was also examined. Families with lower SES were less likely to complete the FUI

(ChiSq(4,991)=33.7,  $p<.001$ ), and the reason for nonparticipation was more likely to be an invalid phone number (ChiSq(4,180)=10.7,  $p=.001$ ). **Conclusion:** Results suggest that the FUI helps to reduce the inflated screen positive rate for families of lower SES, although difficulties with phone contact appear to result in a higher dropout rate between Step 1 and 2. Our next study will assess the validity of a computer-based screening which will integrate Steps 1 and 2; this may reduce disparities in participation in ASD screening and identification.

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## **Abstract 40**

### **A Blood Gene Expression Biomarker for Distinguishing Autism Spectrum Disorders from Other Developmental Delays**

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**Purpose:** The aim of this study was to assess whether patterns of gene expression in blood can distinguish children with Autism Spectrum Disorders (ASD) from those with other forms of developmental delay (DD). **Methods:** Blood mRNA samples isolated from children ages 2-5 years diagnosed with ASD ( $n=174$ ) or DD ( $n=96$ ) were sequenced using next-generation sequencing of RNA (RNASeq) to measure blood gene expression levels. The samples were divided into a training set and a test set. Genes that differed between ASD and DD in the training set were selected by t-test and used to develop a support vector machine (SVM) signature. The signature performance was assessed on the test set. **Results:** The classifiers showed an ability to partially distinguish the two groups based on gene expression. The mean AUC of the ROC curve for the test set was  $65.5 \pm 3.8\%$ . At the maximum accuracy cutoff, average classification accuracy was  $65.7 \pm 3.3\%$ , sensitivity was  $60.6 \pm 15.1\%$ , and specificity was  $70.7 \pm 14.0\%$ . At the 90% sensitivity cutoff, specificity was  $23.9 \pm 8.0\%$ . Gene categories that significantly differed between ASD and DD samples included cell cycle, neuronal and immune processes. **Conclusion:** This study is the first to report a blood gene

expression signature for distinguishing between ASD and DD. The results provide evidence that blood biomarkers may provide an objective method of identifying children at increased risk for ASD within populations with symptoms of developmental delay, which could improve physicians' certainty in making referral decisions, and thereby shorten the time from suspicion to diagnosis.

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## **Abstract 41**

### **Quality of Life Measures in Families with Children with Autism Spectrum Disorder**

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**Purpose:** Quality of life (QoL) measures are now being recognized as outcome parameters for interventions and evaluations for service delivery in persons with disabilities. There are various instruments that are being utilized to assess quality of life. However, there are no standardized instruments to broadly assess child and family quality of life in children with autism and other neurodevelopmental disorders. This study assessed the reliability of the Child and Family Quality of Life (CFQL) tool and looked into existing baseline differences in the QoL of Autism Spectrum Disorder (ASD)-affected children and their families compared to other developmental conditions. **Methods:** The CFQL was developed to measure QoL in the child, family, caregiver, financial, external support, partner/ relationship and coping domains using a 5-point Likert scale. This tool was completed by parents of children <4 years of age prior to a comprehensive evaluation for ASD at the Center for Autism. There were a total of 245 patients included in the study period from September 2010 to December 2011. Of the 245 patients, there were 212 respondents to the CFQL. **Results:** Patients who received an ASD diagnosis were comparable to those who did not receive an ASD diagnosis in all areas of the CFQL at the time of diagnosis except for the family quality of life. Specifically, those patients with an ASD diagnosis had a significantly lower Family Quality of Life response compared to those without an ASD diagnosis (but often with other developmental conditions), with a mean difference of -0.32 (95% CI -0.61 to -0.02, P=0.04). **Conclusion:** This study shows that at the time of diagnosis of ASD, there is already a notable effect on the family quality of life. It is therefore critical to impart adequate support for the family even at the time when the diagnosis of ASD is suspected.

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## Abstract 42

### The Role of Dyadic Interactions in Parent and Sibling Distress after a Child's Death from Cancer

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**Purpose:** Research suggests that parent distress increases risk for child distress via negative parent-child interactions. It is unknown whether this is more pronounced among children who have lost a sibling to cancer. We expected that the association between parent and child internalizing problems would be mediated by the quality of parenting and communication, and that negative parent-child interactions would have a stronger impact on internalizing problems among bereaved siblings than controls. **Methods:** After their child's death from cancer ( $M=12.45$  months), families with a surviving child ( $n=88$ ) and matched comparison families ( $n=73$ ) were recruited from three institutions in the U.S. and Canada. The Internalizing Problems score on the Adult and Youth Self-Report was used to measure parent and child distress. Parent and child reports of Openness and Problems in communication on the Parent-Adolescent Communication Scale were averaged, and the Child Report of Parent Behavior Inventory measured parental Warmth and Psychological Control. Pearson correlations were computed to examine associations, and multiple regression analyses tested moderated mediation models. **Results:** Mothers' self-reports of Internalizing Problems were associated with child reported Internalizing Problems ( $r=.25$ ); no significant association was found between father and child distress ( $r=.03$ ). Child distress was related to maternal and paternal Openness ( $r=-.28$ ,  $r=-.30$ ) and Problems ( $r=.42$ ,  $r=.34$ ) in communication, Warmth ( $r=-.39$ ,  $r=-.28$ ), and Psychological Control ( $r=.33$ ,  $r=.28$ ). The association between mother and child distress was mediated by Openness and Problems in communication, Warmth, and Psychological Control. The association between father and child distress was mediated only by Openness. No evidence for moderated mediation was found between the two groups. **Conclusion:** Although negative parent-child interactions were mediators between parent and child distress, the effect was not stronger for bereaved families relative to controls. This suggests that the quality of dyadic interactions is important for all children's adjustment when a parent is distressed.

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## **Abstract 43**

### **Factors Associated with the Later Age of Diagnosis of Autism in Children with Down Syndrome**

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**Purpose:** Down syndrome (DS) is associated with an increased risk of autism spectrum disorder (ASD). The mean age of ASD diagnosis is 4 years in the general population and 8-11 years in children with DS. The aim of this study is to examine factors contributing to this later age of diagnosis. **Methods:** We identified patients with principal or secondary diagnoses of DS and ASD seen from January 1, 2002 to October 31, 2012 using our hospital data warehouse. We identified 37 children ages 2-21 years with this dual diagnosis and completed a chart review. Factors evaluated: demographics, age of ASD diagnosis, ASD and cognitive evaluation results, regression, behaviors leading to diagnosis and who suspected it, other behavioral issues, and co-morbid medical conditions. **Results:** Sample included 68% male and 32% female. Age of diagnosis within the sample ranged from 2.5 to 16.4 years with a mean of 8 years and median of 6 years, 11 months. Cognitive testing was available for 29 of 37. Of these, 34% had moderate intellectual disability and 66% severe. Overall rates of regression were 41%, most frequently in speech (35%) and adaptive skills (11%). Age of regression ranged from 2-12 years with 35% (13/37) having regression after age 4. ASD was suspected initially by parents or teachers in 62% of children, by DS clinic in 35%, and by general pediatricians in 11%. Common behavioral and medical co-morbid conditions included aggression (70%), sleep disorder (62%), self-injurious behaviors (27%), seizures (13%), and infantile spasms (5%). **Conclusion:** Regression in DS and ASD is reported later than in ASD alone. The later age of diagnosis may be related to co-morbid severe intellectual disability and later age of regression. Increased awareness by pediatric professionals about the increased risk of ASD in DS is required for earlier identification. ASD screening should be continued longer due to later age of presentation of ASD symptoms and regression at a later age. Earlier diagnosis of ASD in children with DS will enable the implementation of earlier interventions which have been shown to improve outcomes in other populations.

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## **Abstract 44**

### **Title: PLAY Project Intervention for Autism: A Randomized Controlled Trial**

*Richard Solomon, MD, None, Ann Arbor Center for DBP, Ann Arbor, MI*

**Purpose:**To evaluate the PLAY Project Home Consultation (PLAY) parent training model to reduce autism severity in young children with autism spectrum disorders (ASD). **Methods:**128 children with ASD, 2 years 8 months to 5 years 11 months, paired by age, gender, severity, were randomly assigned to either PLAY, a parent-mediated, developmentally based intervention, or community standard intervention (CS) at 4 Easter Seals sites. Two one-year cohorts (112 families) completed intervention and post-intervention data collection. PLAY Home Consultants (HC) coached caregivers monthly for 12 months using modeling, video and written feedback. CS consisted primarily of 10-12 hours per week of special education pre-school. Measures included A.) Change in autism-related diagnostic category (Autism Diagnostic Observation Schedule; ADOS) B.) Blinded observations of parent (Maternal Behavior Rating System; MBRS) and child (Child Behavior Rating System; CBRS) interactions; C) developmental outcomes, (Mullen Scales of Early Learning, MSEL) and parent-reported vocabulary (MacArthur Communicative Development Inventory, MCDI). **Results:**PLAY children were twice as likely as CS children to improve in ADOS diagnostic category (odds ratio of 2.29;  $\chi^2(3, N = 112) = 31.56, p = .000$ , Wald estimate = 4.70,  $p = .030$ .) Improvements in parent interaction quality, responsiveness and affect showed large treatment effects ( $F(4, 102) = 15.68, p = .000$ , partial  $\eta^2 = .38$ ). Child attention and initiation also evidenced a significant time x group effect ( $F(2, 104) = 12.20, p = .000$ , partial  $\eta^2 = .19$ ). Developmental outcomes improved in both groups but did not show treatment effects. PLAY parents reported high satisfaction (quality of HCs:  $M = 4.83, SD = .31$ ; materials and feedback reports:  $M = 4.66, SD = .45$ ). **Conclusion:** The PLAY Project intervention for children with ASD is the first large-scale effectiveness study in the U.S. of a manualized, intensive developmental intervention model to show reductions in autism severity and shows promise as an option for autism intervention for an underserved population.

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## **Abstract 45**

### **Parenting Stress Worsens Developmental Outcomes in Children Treated with Laser Surgery for Twin-Twin Transfusion Syndrome**

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**Purpose:** Twin-Twin Transfusion Syndrome (TTTS) develops in monochorionic twins from unbalanced sharing of blood through vascular communications in the common placenta. The shunting of blood from one twin (donor) to the other twin (recipient) leads to high rates of perinatal mortality and neurodevelopmental morbidity. In other populations, parenting stress has been shown to be associated with worse behavioral and cognitive outcomes, and parenting stress has been shown to be elevated in parents of children with developmental problems. However, studies of long-term neurodevelopmental outcomes of infants with TTTS post-surgery are few and underpowered, and none have examined the effects of parenting stress on child outcomes. **Methods:** Data were prospectively collected from surviving children treated between 2008-2010. Neurodevelopment at age 24 months ( $\pm 6$  weeks) was assessed via the Battelle Developmental Inventory (BDI) comprising five subscales: adaptive, personal/social, communication, motor, and cognitive scores. Parenting stress was measured with the Parenting Stress Index- Short Form. Vital statistics and socio-demographic covariates were obtained. Multilevel linear regression models were used to evaluate risk factors for BDI subscales at both child- and pregnancy/family-levels. **Results:** 100 children (57 families) were evaluated. Intraclass correlations for subscales were high (adaptive, .24; personal/social, .76; communication, .74; motor, .39; cognitive, .75) indicating a large proportion of shared variance among siblings due to common genetic and social environment. Parenting stress was associated with significantly lower communication (Beta=-.29,  $p < .05$ ) and cognitive scores (Beta=-.28,  $p < .05$ ) and accounted for 8% of the variance in these BDI subscale scores. **Conclusion:** Increased parenting stress was significantly associated with worse developmental outcomes in this cohort of TTTS children. Identification and intervention for parental stress may help optimize the caregiving environments for at-risk children.

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## **Abstract 46**

### **Are We Successfully Training Pediatricians to Assess Children's School Experience?**

*Lauren A. Tarnok, MD, Ellen J. Silver, PhD, Ruth EK Stein, MD, Pediatrics, Albert Einstein College of Medicine/CHAM, Bronx, NY*

**Purpose:** Early recognition of school difficulty can improve outcomes, and both Bright Futures and APA Educational Guidelines say that pediatric residents should obtain a domain specific school history from both parent and child. Our objective was to assess pediatric residents' attitudes and approaches to identifying children with school difficulty and to explore the association of year of training with self-reported competence and responsibility for this activity. **Methods:** We invited the 85 pediatric residents in our urban academic medical center to participate in a cross-sectional electronic survey. The primary analyses were descriptive. Associations of year of training with self-reported competence and responsibility were explored using Kruskal-Wallis tests. **Results:** We received 37 responses (44%). 84% of respondents routinely ask a broad question about school when seeing a 6-10 year old child for healthcare maintenance. However, only 59% routinely ask about grades and only 13% about bullying. Self-reported competence for identifying depression, anxiety, behavior management problems, and learning disabilities (LD) were each rated as fair or poor by 51-60%. Most agreed that pediatricians should be responsible for identifying ADHD, depression, anxiety, behavior management problems, and stressful family environment (75-100%), but only 60% agreed that pediatricians should be responsible for identifying LD. Those with later training did not report higher levels of competence or responsibility. 97% indicated lack of time as a barrier to obtaining a comprehensive school history. **Conclusion:** Pediatric residents ask a general question about school, but do not routinely explore other domains of a child's school experience as suggested by the Bright Futures Guidelines. Most report poor or fair competence in identification of behavior and learning problems. These data suggest that residents need additional educational experiences in the assessment of children with school difficulty.

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## **Abstract 47**

### **Randomized, Controlled, Phase 2 Trial of STX209 for Social Function in ASD**

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**Purpose:**To examine the efficacy, safety, and tolerability of STX209 (arbaclofen) in patients with ASD, age 5-21 years. STX209 is a selective GABA-B agonist that is hypothesized to modulate mGluR5 receptor signaling, and to augment inhibitory neurotransmission. It rescues neuronal morphology in animal models of fragile X syndrome, and showed benefits in the social domain in an open-label study in Autism Spectrum Disorder (ASD). **Methods:**A 12-week, double-blind, placebo-controlled trial was conducted in 150 subjects with Autistic Disorder, Asperger's, or PDD-NOS. Up to 2 other psychoactive medications were permitted, excluding antipsychotics and anxiolytics. The primary endpoint was the Aberrant Behavior Checklist-Social Withdrawal subscale (ABC-SW). Funded by Seaside Therapeutics, Inc., Cambridge, MA. **Results:**130 subjects completed the study, with 10 (8 on STX209, 2 on placebo) discontinuing due to adverse events, which were generally behavioral (e.g., aggression, sleep disturbances). There were 2 serious adverse events (suicidal ideation on STX209; anaphylaxis on placebo). Suicidal ideation also occurred in 1 subject on placebo (not an SAE). STX209 was well-tolerated, with 10% reporting affect lability and 9% somnolence. On the ABC-SW, subjects on STX209 and placebo showed similar improvement ( $-5.4 \pm 0.8$  vs.  $-6.0 \pm 0.8$ , mean  $\pm$  SEM,  $p=0.5$ ). On the CGI-S, there was greater improvement on STX209 ( $-0.6 \pm 0.1$  vs.  $-0.2 \pm 0.1$ ,  $p=0.006$ ). On all other secondary endpoints, results favored STX209 numerically, but did not reach significance (e.g., VABS Socialization standard score:  $4.4 \pm 1.2$  vs.  $2.0 \pm 1.2$ ,  $p=0.15$ ). In a post-hoc analysis among subjects with the same Vineland raters (clinician and parent) at baseline and 12 weeks ( $n=97$ ), as specified in the protocol, STX209 showed significant benefit on the VABS-Socialization scale ( $7.1 \pm 1.4$  vs.  $1.8 \pm 1.3$ ,  $p=0.006$ ). Improvements were numerically larger in subjects with higher baseline function. **Conclusion:**STX209 was well-tolerated and shows potential for clinically-meaningful improvement in social function. Drug effects were more evident in higher-functioning subjects. Further prospective study is needed.

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## **Abstract 48**

### **Identification of Early Developmental Deficits in Infants Diagnosed with Neonatal Abstinence Syndrome**

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**Purpose:** To date few studies have addressed developmental outcomes for infants prenatally exposed to heroin, methadone, or other opioids, including prescription analgesics, although use of these substances continues to rise. The purpose of this study was to assess for the presence of early developmental deficits in infants treated for Neonatal Abstinence Syndrome (NAS), a pattern of neurologic symptoms that may include seizures, high muscle tone, inconsolability, irritability, sneezing, stuffiness, excessive or poor sucking, and a high-pitched cry, which develop when the infant is abruptly deprived of opioid at the time of birth. **Methods:** Prior to discharge from a post-acute care hospitalization for NAS management, 21 infants (mean age: 55 days, 52% male) with prenatal exposure to heroin, methadone, or other opioids, including prescription analgesics, were evaluated using subscales of the Bayley Scales of Infant and Toddler Development, 3rd Edition (Bayley-III). Premature (less than 37 weeks gestation) and medically fragile (congenital heart or lung disease, known chromosomal anomaly) infants were excluded from analysis. **Results:** On the Bayley-III, 15% (n=3) of infants scored in the borderline to significantly delayed range for Cognition. For the Total Language Composite, 30% (n= 6) of infants scored in the borderline to significantly delayed range. Finally, 20% (n= 4) of infants scored in the Low Average range for the Total Motor Composite. **Conclusion:** This study reveals a variety of developmental deficits present during the first months of life for infants with a history of NAS. Small study size and the presence of possible co-existent prenatal poly drug exposure were limitations to this analysis. Further study is needed to compare these findings to those of infants without NAS history, and to determine the trajectory of these delays through early childhood. This information is beneficial as it highlights a group of otherwise healthy infants that may benefit from early developmental intervention.

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## **Abstract 49**

### **Bayley-III Language Scores at Two Years of Age Predict Subsequent ASD Diagnosis Among Children Referred for ASD Screening.**

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**Purpose:** This study investigated whether Bayley-III Language scores are predictive of subsequent ASD diagnosis among infants and toddlers referred for secondary screening due to concerns about possible ASD. **Methods:** This is a retrospective chart review. We report preliminary data from a group of patients referred due to concerns about language delays and/or social, behavioral or regulatory issues including suspected ASD. All children completed Bayley-III testing as part of their secondary screening visit. If clinical observation or parent report indicated concerns about possible ASD, referral was made for a comprehensive diagnostic evaluation. **Results:** The sample included 72 children (mean age: 23.75 months; range: 16.50-32.23 months), of whom 24 subsequently were diagnosed with ASD, 42 with non-ASD language delays and 6 with other developmental delays. Performance on the Bayley-III Language Subscale was significantly lower for children later diagnosed with ASD (mean score=57.58), compared to those who were diagnosed with language or other developmental delays (mean score=83.77;  $p<.001$ ). A pattern of Receptive (RC) and Expressive (EC) Communication Subtest scores below 5 was associated with a greater likelihood of ASD (Sensitivity=0.83, Specificity=0.90, Positive Predictive Value=0.80, Negative Predictive Value=0.91, Relative risk ratio=9.41). **Conclusion:** The Bayley-III can identify the social communication deficits characteristic of ASD, predicting ASD diagnosis with a high degree of accuracy and differentiating between two-year-olds who have ASD and those who have non-ASD language delays. These findings have direct clinical applications, and suggest that children who have RC and EC scores below 5 should undergo comprehensive diagnostic evaluation for ASD without delay.

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## **Abstract 50**

### **The Impact of Cognitive Functioning on Quality of Life in Children with Sickle Cell Disease**

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**Purpose:** Children with sickle cell disease (SCD) are at a high risk for neurocognitive impairment even in the absence of stroke. The current study examined the impact of cognitive ability on health related quality of life (HRQL) in pediatric patients with SCD without a history of stroke. It was hypothesized that neurocognitive impairment is associated with decreased HRQL. **Methods:** Children, ages 8-16 years, with SCD and no history of stroke were enrolled during regular clinic visits at the Duke University Pediatric Sickle Cell Clinic. Participants were administered the Working Memory Index of the WISC-IV, the Pediatric Quality of Life Inventory (PedsQL), and the Wong Baker Pain Scale. Caregivers completed the Behavior Rating Inventory of Executive Functioning (BRIEF) and the PedsQL. Data pertaining to disease severity were abstracted from the child's medical record. **Results:** Thirty children (46.9% female; 81.8% HbSS) and their caregivers completed the study. After controlling for pain, disease severity, and sex, working memory ability significantly predicted children's HRQL [Self-rated: Adj.  $R^2=0.29$ ,  $F(5, 25)=3.4$ ,  $p<0.05$ ; Parent-rated: Adj.  $R^2=0.22$ ;  $F(5, 25)=2.7$ ,  $p<0.05$ ]. Specifically, stronger working memory was associated with significantly higher levels of self- ( $b=0.23$ ,  $p<0.05$ ) as well as parent-reported HRQL ( $b=0.19$ ,  $p<0.05$ ). Of note, gender was the only covariate that reached statistical significance in the final model. Specifically, being female was associated with significantly lower self-reported HRQL ( $b=-0.37$ ,  $p<0.05$ ). **Conclusion:** These data indicate that cognitive functioning significantly predicts overall HRQL in children with SCD without prior stroke. In light of these findings, research should work to identify interventions, such as computerized cognitive training, that can remediate cognitive decrements in children with SCD. These interventions may have a salutary affect on HRQL, making this a particularly important area of future research. In addition, further research is needed to explore the association between female gender and HRQL.

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## **Abstract 51**

### **Clinical Criteria for Pharmacotherapy in Preschool Children with ADHD**

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**Purpose:** To determine which clinical variables influence the decision by medical specialists (MDs) to initiate pharmacotherapy in P-ADHD. **Methods:** The Preschool ADHD Treatment Questionnaire (PATQ) was developed and mailed to a randomized national sample of 3,000 MDs trained in the management of ADHD. The PATQ asked about MD demographics, practice setting, and the importance of 19 different clinical factors for initiation of pharmacotherapy. These 19 factors reflect 5 areas of concern: impact on education/developmental therapy, impact on peer relations/social life, medical risk factors, parental stress, and safety. MDs were asked to rate each factor on a 4-point Likert scale from "Not Important" to "Very Important". **Results:** The sample consisted of 614 respondents: 322 developmental-behavior pediatricians, 170 child psychiatrists, 54 adult psychiatrists and 68 child neurologists. Respondents varied considerably in rating clinical factors as "Important" or "Very Important" in deciding to treat with medication. Almost all stated risk of injury to self or others were important factors (96% and 94% respectively). Recent expulsion from daycare/preschool and need for constant adult supervision were also widely endorsed (89% and 86%, respectively). Problems with providing needed therapies were also rated as important (81%). 60% identified parent and marital stress as important. Fewer respondents identified social implications of ADHD (behavior embarrassing to public, 38%) or ADHD risk factors (prenatal exposure to alcohol, 27%; cocaine, 26%; or tobacco, 9%; or prematurity, 14%) as being important. No significant differences were noted among the 4 subspecialties regarding which clinical factors were most or least important. 128 MDs (20.8%) reported prescribing medication as part of an initial treatment plan; these MDs were more likely to rate variables as "Important" or "Very Important", especially family history of ADHD, hyperactivity noted by >2 teachers, behavior causing public embarrassment, and behavior precludes social outings ( $X^2; p < .0001$ ). **Conclusion:** Safety and educational concerns were most important and medical risk factors were least important as clinical criteria for medical specialists when deciding to prescribe medication for preschool ADHD.

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## Abstract 52

### Medication Management of Preschool ADHD by Pediatric Sub-Specialists: Non-Adherence to AAP Clinical Guidelines

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**Purpose:** Current clinical guidelines for pediatricians (AAP) recommend that preschoolers with ADHD (P-ADHD) generally receive treatment with behavioral modification (BM) before pharmacotherapy, and that methylphenidate (MPH) be used as the first line medication. The objectives of the study are to examine to what extent pediatric subspecialists (PSs) adhere to AAP guidelines regarding pharmacotherapy for P-ADHD and to identify differences in treatment approach among subspecialties. **Methods:** The Preschool ADHD Treatment Questionnaire (PATQ) was developed and mailed to a randomized sample of 3,000 PSs nationwide. The PATQ asked how often PSs recommend parent training in BM and how often they recommend medication as a first- or second-line treatment. PSs were also asked which type of medication they typically choose first. **Results:** 714 (23.8%) surveys were received, and analyses were limited to 560 board-certified pediatric subspecialists who diagnose P-ADHD: 322 developmental-behavioral pediatricians (DBP), 170 child psychiatrists (CP), and 68 child neurologists (CN). 21% of PSs reported using medication as a first-line treatment often or very often. 69.5% use medication as a second-line treatment often or very often. Availability of BM (or lack thereof) was not associated with decision to use medication as a first-line treatment. Among PSs who prescribe medication for P-ADHD (first- or second-line), 38.3% said they prescribe a medication other than MPH initially (19.4% amphetamines; 18.9% non-stimulants). 90.7% of PSs often or very often recommend BM -- even in communities with limited availability. No differences were noted across subspecialties regarding medication initiation criteria or selection. Likewise, no differences were noted between PSs who primarily treat patients with Medicaid versus private insurance. When adherence to AAP guidelines was defined as initial treatment with BM (not medication) and pharmacotherapy specifically with MPH as second-line treatment, only 12% CP, 8% DBP, and 9% CN complied with clinical guidelines. 19% of PSs stated that they expected the number of children for whom they will prescribe medication in the future will increase (vs 78% no change and 3% decrease). **Conclusion:** The overwhelming majority of pediatric subspecialists deviate from current AAP guidelines for treatment of

preschool ADHD regarding medication initiation and selection.

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## **Abstract 53**

### **Adverse Childhood Experiences: How do Pediatric Providers Learn About and Use Them in Their Clinical Care?**

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**Purpose:** To understand pediatricians' knowledge, attitudes and behavior regarding adverse childhood experiences (ACEs) and to provide insight into barriers and facilitators to learning about and using ACEs during clinical care. **Methods:** A 28-item email survey was sent to all members of the Pennsylvania Chapter American Academy of Pediatrics. Bivariate analyses were conducted using chi square tests. **Results:** 308/1600 (19%) responded to the survey but not all surveys were complete. 279/282 (99%) of respondents strongly agree or agree that providers should know about their patients' ACEs. 73% reported asking about ACEs in some way during routine practice. 80% (162/203) of those who routinely ask about ACEs reported they feel very or moderately comfortable doing so, compared to 34% (12/35) of those who do not routinely ask ( $p < .0001$ ). Similarly, 54% (103/191) of the pediatricians who routinely ask about ACEs thought they had adequate resources to provide compared to 36% (19/53) of those who do not routinely ask ( $p < .02$ ). Two thirds stated that they would prefer a self-report model rather than direct questioning. Attitude and beliefs about ACEs were better indicators as to whether pediatricians ask about ACEs. 76% (203/266) believe they should know and ask about their patients' ACEs. Physician gender, provider role (i.e., attending physician vs. resident/fellow), setting (i.e., academic, non-academic), location (i.e., urban, non-urban) or familiarity with the ACE studies were not associated with pediatricians asking about ACEs. **Conclusion:** In this small sample of pediatric providers almost all thought that it is important to know about their patients' ACEs. Attitudes and beliefs about the importance of ACEs, self-reported comfort level and perceived access to community and institutional resources are associated with higher reported ACEs screening during pediatric visits,

whereas specific practice type and location were not. Educational efforts, standardized questions that could support self-report models, and knowledge about and access to community-based resources may enhance pediatricians' ACEs screening.

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## **Abstract 54**

### **Visual Motor Deficits in Children with Fetal Alcohol Spectrum Disorder**

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**Purpose:** Children with Fetal Alcohol Spectrum Disorders (FASD) are known to have visual motor deficits, but the extent to which these deficits are related to visual perception or fine motor deficits is unclear. It was hypothesized that children with FASD would have significantly worse visual motor scores than the normative sample. Second, children with greater symptoms of Fetal Alcohol Syndrome (FAS) would have greater visual motor deficits. Third, motor coordination scores would be significantly worse than visual perception scores across groups. Fourth, children with poor motor coordination would also have greater deficits in daily living skills. **Methods:** Participants were 30 children assessed for FASD with the 4 Digit Diagnostic Code (Astley, 2004) through a multi-disciplinary clinic. Children were 41% female (mean age = 9.7 years) and 82% were adopted/foster care. Group 1 consisted of children with FAS, partial FAS, or static encephalopathy (N = 18). Group 2 consisted of children with Neurobehavioral Disorder (N = 12). A neuropsychological battery was given including Beery Visual Motor Integration Test-6th Edition and Vineland Adaptive Behavior Scales-Second Edition. **Results:** Visual motor skills were one standard deviation below the normative average. Results using a two-way ANOVA with repeated measures did not reveal a significant interaction effect ( $F(2, 27) = .5; p > .05$ ). The main effect of group was not significant ( $F(2, 27) = .03; p > .05$ ). There was a significant effect for visual motor subtests ( $F(2, 27) = 7.97; p < .0002$ ). Post hoc contrasts revealed that visual perceptual skills were significantly better developed than visual motor or motor coordination skills ( $p < .001$ ). Regarding the secondary hypothesis, children with motor coordination deficits did not show significantly worse daily living skills ( $F(1, 27) = .61; p > .05$ ). **Conclusion:** Children with FASD have deficits in visual motor skills, which appear to be related to fine motor coordination rather than visual perception. Deficits in motor coordination did not predict daily living skills, which may indicate a greater influence of other

factors such as executive function skills.

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## **Abstract 55**

### **Inconsistent Recognition of Anxiety Symptoms in Preschoolers with Co-Occurring Anxiety and Oppositional Defiant Behavior**

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**Purpose:**To test the hypothesis that, when preschoolers have oppositional-defiant (OD) behavior associated with anxiety, some caregivers/reporters might not easily recognize their anxiety symptoms. **Methods:**Data were collected retrospectively from parent and teacher forms of the Early Childhood Inventory-4 (ECI-Gadow & Sprafkin, 2009) for 193 3-6 year olds referred for developmental-behavioral pediatrics evaluation. After excluding subjects for whom either a parent or teacher ECI was missing, 151 were analyzed. From parent and teacher ratings, Oppositional-Defiant (OD), Total Anxiety (TA), and Generalized Anxiety (GA) severity scores were calculated. A High OD subset was created of subjects with OD symptom severity scores, according to parent and/or teacher report, of more than one standard deviation above the mean of a normative sample of preschoolers (Gadow & Sprafkin, 1997). Two-way tables were produced according to whether parents and/or teachers rated these High OD children as having High or Low Anxiety using a +1 s.d. cutoff in the normative sample (for GA) or in our study population (for TA). **Results:**Of the 151 children, 61 (40.4%) had high OD scores. Of these 61, 43 (70%) were also rated as having high GA by at least a parent or teacher. However, 27 of these (62.8%) were identified as having high anxiety by only one observer. Of the 61 with high OD scores, 15 (24.6%) were rated as having high TA by at least parent or teacher. However, 9 of these 15 (60%) were identified as having high anxiety by only one observer. Thus, in 60-63% of the cases in which high anxiety was associated with high OD behavior, one or the other observer did not recognize the child as anxious. With either anxiety construct, the "naïve observer" was not more likely to be a parent or teacher. **Conclusion:** Among preschool children who have high levels of OD behavior associated with high anxiety, their anxiety may often not be apparent to a parent or teacher. Although these results do not prove causality they suggest that, in some situations, acting out behavior may be the only manifestation of anxiety. The findings support considering targeting anxiety in treating OD behavior in preschoolers.

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## **Abstract 56**

### **Evaluating Decision-Making in a Pediatric Rheumatology Clinic**

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**Purpose:**With the increasing prevalence of pediatric chronic illness, there is a growing need for comprehensive, lifelong medical care. Transitioning patients from pediatric to adult institutions, alongside the shift in legal responsibility, calls for the development and activation of medical decision-making skills. This study assessed caregiver and adolescent medical decision-making characteristics in a pediatric urban hospital's outpatient Rheumatology clinic. It is hypothesized that (1) pediatric patients who are more involved in their care will report lower decisional conflict, (2) children want to be involved in their care, and (3) higher health consciousness will be positively correlated with valuing involvement in medical decision making, actual involvement in decision making, and lower decisional conflict. **Methods:**This was an anonymous survey study for patients with chronic rheumatologic illness presenting to the outpatient Rheumatology clinic at the Children's Hospital Boston. Study participants included 14 pediatric patients and their caregivers presenting to the clinic. **Results:**Analyses revealed significant positive correlations between adolescent and caregiver health consciousness ( $r = .72, p = .008$ ), adolescent and caregiver decisional conflict ( $r = .62, p = .04$ ), and adolescent actual involvement and valuing involvement ( $r = .58, p = .04$ ) and a significant negative correlation between adolescent actual involvement and decisional conflict ( $r = -.82, p = .001$ ). **Conclusion:** Although the sample size was limited for statistical analyses, results suggest pediatric patients' considerable motivation for involvement in care. Given the link between treatment adherence, medical advocacy skills and decision-making, pediatric medical decision-making is a valuable area for future research.

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## **Abstract 57**

### **Predictors of Fatigue in Children with Sickle Cell Disease**

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**Purpose:** Fatigue is a commonly reported experience for children with sickle cell disease (SCD) that can negatively impact their quality of life. However, little is known about how specific biological and socioemotional factors impact this symptom. Therefore, the current study examined the impact of disease severity, hemoglobin levels, and internalizing symptoms on fatigue in children with SCD. **Methods:** Children with SCD aged 8-16 (n=30) and a caregiver were recruited during regularly scheduled clinic visits. Measures included the PedsQL Multidimensional Fatigue Scale, a self- and parent-report inventory of a child's general, sleep/rest, and cognitive fatigue. Caregivers also completed the Child Behavior Checklist, yielding a measure of internalizing (anxiety, depression, somatic) symptoms. Number of hospitalizations over the last year was used as a proxy of disease severity, per medical record. Steady state hemoglobin levels were also abstracted via medical records. **Results:** Simultaneous multiple regression models utilizing hemoglobin level, disease severity, and internalizing symptoms significantly predicted fatigue (child-rated: Adj.  $R^2=0.22$ ,  $F(3,24)=3.6$ ,  $p<0.05$ ; parent-rated: Adj.  $R^2=0.19$ ,  $F(3,24)=3.1$ ,  $p<0.05$ ). In the parent model, internalizing symptoms was the only significant predictor of fatigue ( $b=-0.39$ ,  $p=0.006$ ). Specifically, increased levels of internalizing symptoms were associated with higher levels of parent-reported fatigue. In contrast, in the child model, disease severity was the only significant predictor of fatigue ( $b=-7.96$ ,  $p=0.01$ ), indicating more severe disease predicted increased fatigue. **Conclusion:** These data suggest that internalizing symptoms and hospitalizations are significant predictors of fatigue in children with SCD. Surprisingly, hemoglobin levels were not associated with fatigue. In light of these results, it may be helpful for clinicians to be mindful of subjective mood symptoms and recurrent hospitalizations during the assessment and intervention of fatigue. Ultimately, additional research investigating the relationships among these variables will lead to a better understanding of how to best identify and alleviate fatigue for children with SCD.

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## **Abstract 58**

### **Behavioral Pediatric Referral Practices in Primary Care: Impact of Amount and Type of Training on Referrals**

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**Purpose:** Currently 25% of presenting problems reported for children in primary care are for behavioral and mental health concerns. Parents most often report behavioral concerns to their primary care provider instead of seeking mental health services. Behavioral health concerns are currently taking more physician time and resources; however, physicians are not trained nor have the time to manage these concerns. **Methods:** The current study explores the relationship between physician training and referral practices. We conducted a survey of approximately 1500 pediatricians and family physicians from the Midwestern United States. We asked physicians to rate the frequency of how often they make outside referrals are made to other professionals. **Results:** Bivariate analyses demonstrated significant positive correlations between an appropriate referral to a psychologist and number of hours didactic training in discipline strategies ( $r = .152$ ,  $p = .006$ ) and time-out ( $r = .163$ ,  $p = .003$ ). Significant positive correlations were found between referral to a psychologist and number of hours of supervised training in discipline strategies ( $r = .192$ ,  $p < .001$ ) and time-out ( $r = .212$ ,  $p < .001$ ). The bivariate analyses demonstrated significant positive correlations of behavior analyst referrals with number of hours didactic training in discipline strategies ( $r = .126$ ,  $p = .033$ ) and time-out ( $r = .152$ ,  $p = .010$ ). The multiple regression model with all four predictors (didactic training in discipline strategies, didactic training in time out, supervised training in discipline strategies and supervised training in time out) with dependent variable of referral to a psychologist produced  $R^2 = .049$ ,  $F(4, 321) = 4.149$ ,  $p < .003$ . **Conclusion:** The present study indicates a potential underuse of outside referral sources by physicians to help manage behavioral concerns for children. Results from the present study suggest the impact of physician training on appropriate behavioral referrals.

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## **Abstract 59**

### **Experiences of Stigma Among Gay Fathers**

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**Purpose:** Almost 70,000 male couples are raising children under the age of 18 in the U.S. While these families are increasing in numbers and visibility, very little research has described the pathways they took to becoming fathers, or their parenting experiences. **Methods:** Data were collected via an anonymous internet-based survey from gay fathers in TN and CA who were identified through community groups, online advertisements, and word of mouth. **Results:** Data are available from 47 respondents in CA, the majority of whom became fathers through foster care or adoption (49%), and 14 in TN, most of whom (70%) had become fathers in a previous heterosexual relationship. In both states, most respondents were primarily white and non-Hispanic, had a bachelor's degree or higher, and were in a stable relationship. Experiences of active stigma and fear of stigmatization were very different in TN, which has few legal and social protections in place for lesbians and gay men, vs. in CA, in which there are many more relationship protections in place. More than 28% of TN respondents reported experiencing stigmatization at work at least once a month. 35% reported avoiding straight friends at least once a month out of fear of experiencing stigma, and nearly 30% reported avoiding co-workers. In contrast, 6.4% of CA fathers reported experiencing stigma at work and avoiding religious settings out of fear of stigma. 21% of TN fathers reported that their child had experienced stigmatization from friends at least once a month. No more than 2.1% of CA respondents reported that their child had experienced monthly stigma, in any situation. **Conclusion:** These data provide one of the first examinations of stigmatization of gay men and their children in two states whose legal and social protections for same sex relationships are widely disparate. Findings describe differences also in typical 'pathways to fatherhood' in these 2 states, and suggest that both men and their children face varying levels of discrimination and stigma. Understanding these men's experiences of stigma provides a foundation for clinicians to provide support to children being raised by gay fathers, and motivation for changes in social and legal protections for same-sex relationships.

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## Abstract 60

### Diagnostic Evaluation of Children with Autism: Real-Life versus Recommended

*Alexis Tchaconas,, Pediatrics, Cohen Children's Medical Center, East Northport, NY, Andrew Adesman, MD, Pediatrics, Hofstra North Shore-LIJ School of Medicine, Roslyn, NY*

**Purpose:**Children with autism (CWA) are typically referred to child neurologists (CN) and developmental pediatricians (DP) for diagnosis and medical evaluation. Although the American Academy of Neurology and AAP have published clinical guidelines for laboratory evaluation of CWA, experience suggests CN and DP frequently order tests not routinely recommended per existing guidelines (e.g., EEG and MRI) and, conversely, fail to order genetic tests that are routinely indicated -- e.g., chromosomal microarray (CMA) and DNA for Fragile X (FraX). Our objective was to assess to what extent CN and DP order diagnostic tests when evaluating CWA that are not recommended/indicated and/or fail to order tests that are recommended/indicated. **Methods:**A questionnaire was mailed to CN and DP in the US, who were asked to provide demographic information and then indicate which specific laboratory tests they would "routinely order" for a 3½ year old boy with autistic disorder and no seizures, lethargy, regression, dysmorphic features, vomiting or macrocephaly (Hgt = 50%; HC = 90%). Chi square/Fisher Exact tests were done to determine if there were significant differences between CN and DP in tests ordered. **Results:**131 CN and 138 DP responded. 87% CN and 92% DP reported doing >1 lab evaluations of CWA monthly, and 55% CN and 73% DP evaluating >1 weekly. Although neither an EEG nor MRI are indicated in this case, 22% CN and 6% DP noted they would routinely order an EEG (CN>DP; p=.0008), and 63%CN and 14%DP would routinely order an MRI (CN>DP; p<.0001). Although CMA and FraX are indicated, these would not routinely be ordered by 24% CN and 21% DP (CN~DP; p=.27; ns), and 31% CN and 2% DP (CN>DP; p<.0001) respectively. CN and DP did not differ in routinely ordering a chromosomal karyotype (5% each) or a lead level (29% CN vs. 38% DP; ns). **Conclusion:**When evaluating a CWA, many CN and DP order diagnostic tests that are not routinely indicated and fail to order tests that are. Relative to DP, CN are more likely to order EEGs and MRIs - tests that are neither benign nor inexpensive. Newer molecular genetic testing is often not being done as recommended.

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## **Abstract 61**

### **Methylphenidate Patch for Attention Deficit Hyperactivity Disorder (ADHD): Wear Time and Subtype Response**

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**Purpose:** Efficacy and safety of the methylphenidate transdermal system (MTS) patch was previously reported at 9-hr wear time in children/adolescents with ADHD. As some patients need symptom control for late-day activities, MTS efficacy/tolerability was examined at 12-hr wear. To check differential response by ADHD subtype, responses on 9-hr wear were secondarily analyzed from an adolescent study. **Methods:** In randomized, double-blind, placebo-controlled dose titration studies: 211 children ages 6-12 with ADHD tried a 12-hr MTS for 4 wks (Study I) and 214 adolescents ages 13-17 with ADHD tried 9-hr MTS for 7 wks (Study II); results were analyzed by combined vs. inattentive subtypes. Primary endpoints were change from baseline in Iowa Conners Scale Teacher Inattentive/Overactive Factor (I) and ADHD-RS-IV total score (II). **Results:** Mean improvement was significantly better for MTS than placebo patch in each study, regardless of ADHD subtype in Study II. With 12-hr wear, anorexia (AN) & insomnia (IN) rates were twice as high as for 9-hr wear but did not require stopping; other adverse events (AEs) in >7% were abdominal pain, headache (HE), emotional lability, viral infection, weight loss (WL), nervousness, vomiting, pharyngitis, and twitching. Study II AEs were similar in either ADHD subtype (decreased appetite, upper respiratory infection, nausea, HE, AN, IN, nasopharyngitis, and WL). **Conclusion:** MTS is an option with flexible duration 9-12 hr for children with ADHD and for adolescents with either combined or inattentive subtype; AN & IN must be monitored with 12-hr wear.

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## **Abstract 62**

### **Designing A Statewide Quality Improvement Project to Transform Delivery of Children's Mental Health Services in Pediatric Primary Care**

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**Purpose:** Describe a process for designing a statewide quality improvement project to transform delivery of children's mental health services in pediatric primary care. **Methods:** A Modified Breakthrough Series of the Model for Improvement guided all activities. An Expert Panel and Advisory Board convened. A literature review was completed for relevant clinical guidelines and practice parameters. Providers (N=28) from 20 sites completed the AAP Mental Health Practice Readiness Inventory. A convenience sample of parents (N= 385) in each site completed a baseline survey to assess satisfaction with family-centeredness, care coordination and visit outcomes. **Results:** The expert panel and advisory board identified priorities leading to development of a global aim and key drivers. The global aim: To achieve optimal mental wellness for all of Ohio's children and families as soon as possible. The key drivers: 1) Building Protective Skills; 2) Surveillance and Screening; 3) Practice-Based Interventions; 4) Collaboration and Care Coordination; 5) Evidence Informed Pharmacotherapy. Providers identified areas for change: collaborative relationships with community resources (39.3%), mental health promotion (35.7%), support for adolescents (32.1%), medication management (32.1%), screening and surveillance (28.6%). Families reported being very satisfied with family-centeredness (84.29%), care coordination (87.53%) and visit outcomes (92.84%). The team developed curricula, clinical tools, hosted a Learning Session and monthly calls for practices, supported monthly data collection, and provided constructive feedback. **Conclusion:** The Model for Improvement provided a framework for design of a statewide quality improvement project for children's mental health services in pediatric primary care. The Mental Health Practice Readiness Inventory provided useful guidance. The family surveys indicated high levels of satisfaction with the initial practices, and may be more informative in the future if completed by only families affected by emotional, developmental, or behavioral concerns.

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## Abstract 63

### Association of Maternal and Child Vitamin D and Neurodevelopmental Outcomes in Preschool Children

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**Purpose:** Vitamin D is linked to brain development and functioning. Higher vitamin D concentrations in pregnancy have recently been associated with improved mental and psychomotor development in infants. However, it is unknown if maternal and child vitamin D levels continue to influence neurodevelopmental (ND) outcomes in older children. The objective of this study was to determine if vitamin D status during pregnancy and in childhood are associated with neurodevelopmental outcomes in children 4-6 years. **Methods:** A prospective cohort of 146 pregnant mothers and their children were enrolled. Maternal demographics and 25 hydroxyvitamin D (vitamin D) levels were obtained from mothers at 16 weeks gestation. The children's vitamin D levels were obtained at birth and at the 4-6 year old visit. The Beery Test of Visual Motor Integration (VMI) and the Brigance Screen (BS) were administered to the children at 4-6 years to assess ND outcomes. Univariate and multivariate analyses were performed to determine the independent association of vitamin D on ND outcomes. **Results:** The mean vitamin D level in pregnancy at 16 weeks gestation was 31.6 ng/mL (range: 5.3-59.2) and in children at 4-6 years was 29.7 ng/mL (range: 7.2-74.4). In multivariate analysis, when controlling for maternal education, vitamin D levels in mothers at 16 weeks gestation, children at birth, and children at 4-6 years remained independently associated with developmental outcomes. When looking at the child's vitamin D level at 4-6 years, the BS overall quotient increased 0.26 for every ng/ml increase in the child's vitamin D level ( $p=0.007$ ) and the BS academic subdomain increased 0.31 ( $p<0.001$ ). There were no significant associations found between vitamin D levels on the VMI or BS motor and language subdomains. **Conclusion:** Neurodevelopmental outcomes at 4-6 years were significantly associated with maternal vitamin D during the second trimester (16 weeks), as well as the child's vitamin D at birth and at 4-6 years.

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## Abstract 64

### Ostracism and Need Threats in Children and Adolescents

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**Purpose:** This study investigates age and gender differences on the impact of ostracism in children and adolescents on four fundamental psychological needs (belonging, self-esteem, meaningful existence, and sense of control) as described by Williams (2009) temporal need-threat model of ostracism. **Methods:** Participants ( $n=2159$ ), aged 8-18 ( $M = 13.50$ ,  $SD = 2.57$ ), completed the Bullying and Ostracism Screening Scale (BOSS; Saylor et al., 2012) as a part of a school climate assessment. The BOSS contains 15 questions that assess for ostracism experiences and thoughts or feelings that reflect threats to basic psychological needs. Participants were assenting 3rd to 12th graders whose parents received written notification of the assessment and had not elected the opt-out option. The sample of participants was 48% male and 52% female. **Results:** One-way Analysis of Variance with Duncan Post Hoc tests reveal that elementary students report significantly higher frequency of experiences of ostracism [ $F(2, 2132) = 20.29$ ,  $p < .01$ ], threat to belonging [ $F(2, 2139) = 10.27$ ,  $p < .01$ ], threat to self-esteem [ $F(2, 2113) = 14.48$ ,  $p < .01$ ], and threat to meaningful existence [ $F(2, 2110) = 3.09$ ,  $p < .05$ ] than middle and high school students. Both elementary and middle school students show significantly higher threat to sense of control [ $F(2, 2088) = 79.28$ ,  $p < .01$ ] than high school students, with elementary students reporting the highest threat. Independent samples t-tests reveal that female students show significantly higher threat to belonging [ $t(1116) = -2.49$ ,  $p < .05$ ], threat to meaningful existence [ $t(1103) = -3.38$ ,  $p = .01$ ], and threat to sense of control [ $t(1079) = -3.37$ ,  $p = .01$ ] than males. No gender differences are observed on frequency of experiences of ostracism or threat to self-esteem. **Conclusion:** These findings suggest that ostracism has a significant impact on the fundamental psychological needs of children and adolescents. The authors recommend that children and adolescents are assessed for experiences of ostracism during a pediatric visit.

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## Abstract 65

### Maternal Responsiveness in Early Infancy Predicts the Quality of Mother-Child Language Interactions at Kindergarten

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**Purpose:** Participation in rich language interactions is critical to children's language development, yet there is wide variability in the amount and quality of parents' speech to children. Little is known about how patterns of parent-child interaction are established, particularly among at-risk families. Understanding the onset of differences in parents' verbal engagement with their children is crucial to developing interventions for reducing disparities in school readiness. **Objective:** To assess whether maternal verbal responsiveness in infancy (6m) predicts the quality of mother-child language interactions at 54m in low-SES Latino families. **Methods:** Analyses conducted on a subsample (n=84) of mother-child dyads participating in a larger study of child development. Maternal verbal responsiveness was assessed by interview using the StimQ-Infant at 6m. Mother-child language was assessed via observation of mother-child interaction using a wordless picture book at 54m, transcribed and analyzed using CLAN software. **Predictors:** StimQ total score, verbal responsiveness subscale (PVR). **Outcomes:** mother utterances, different words by mother, mother-child turns (back-and-forth interaction). **Confounders:** family SES; maternal literacy and marital status; child gender and firstborn; intervention status. Separate regressions were conducted for each predictor and outcome, adjusting for confounders. **Results:** Mothers: 100% Latino, born outside US, Spanish primary language; 28% HS grads. Children: 52% female. Higher maternal verbal responsiveness at 6m was associated with richer language interactions at 54m (see table). **Conclusion:** Patterns of parent-child interaction that are established early in life remain relatively stable until kindergarten age.

	Outcomes (54mos)		
	# utterances (mother)	# different words (mother)	# mother-child turns
Predictors (6mos): StimQ-I	Beta (std coefficient)	Beta	Beta
Total Score	.33**	.42***	.25*
PVR	.34**	.42***	.18

*p<.05, **p<.01, ***p<.001			
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## Abstract 66

### **Predictors of Externalizing Behavior in the Preschool Years: Implications for Behavioral Surveillance in Pediatric Practice**

*Prachi E. Shah, MD, Pediatrics, Pamela Davis-Kean, PhD, Developmental Psychology, Sharon Simonton, PhD, Institute for Social Research, Daniel Choe, BA, Psychology, University of Michigan, Ann Arbor, MI*

**Purpose:** The purpose of this study was to determine, in a nationally representative sample, how maternal and infant characteristics, including maternal depression, history of poverty, and reports of infant temperament influence the development of externalizing behavior at preschool. We hypothesized that maternal depression, history of poverty, and difficult temperament at age 2 would predict externalizing behavior at preschool, and that maternal depressive symptoms would moderate the relationship between early infant temperament and preschool externalizing behavior problems. **Methods:** Sample included 6150 children, ascertained from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), a nationally representative longitudinal study. Data were utilized from 9-month, 2-year, and preschool timepoints. Child temperament was assessed at 9-months and 2-years with the Infant Toddler Symptom Checklist (ITSC), and maternal depression, SES risk factors and poverty status were assessed at all timepoints using the CES-D and standardized questionnaires. Externalizing behaviors were assessed from responses on the Preschool and Kindergarten Behavior Rating Scales Second Ed. (PKBS-2). Multivariate stepwise regression explored the association between infant temperament, maternal depression and poverty on the development of externalizing behavior problems at preschool, after controlling for maternal race, education, marital status, and child gender. **Results:** After controlling for covariates, multivariate regression models indicated that the most robust predictors of preschool externalizing behavior included history of difficult child temperament at 9-months ( $B = .10, p < 0.001$ ), and 2-years ( $B = .19, p < 0.001$ ), history of poverty at age 2 ( $B = 0.08, p < 0.001$ ), and history of maternal depression at preschool ( $B = .16, p < 0.001$ ). Maternal depression did not moderate the association between infant temperament and externalizing behavior problems at preschool. **Conclusion:** Early predictors of preschool externalizing behavior problems include maternal, socio-economic, and infant characteristics, with infant temperament at 9-months, predicting later behavior problems. Potential opportunities for behavioral surveillance in pediatric practice may include monitoring for early infant

temperament difficulties, maternal depressive symptoms, and SES risk factors.

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## **Abstract 67**

### **Mental Health Beliefs and Perceptions of Barriers to Accessing Mental Health Services among Youth who Transition from Foster Care**

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**Purpose:** Over 20,000 US youth transition from foster care to legal emancipation yearly. Despite a high prevalence of mental health needs, mental health service use declines during this transition period. The study examines beliefs that shape youths' perceptions of need for mental health services and the barriers in accessing services upon transitioning from foster care. **Methods:** Seven focus group interviews were conducted with youth who had accessed mental health services after transition from foster care. Interviews addressed perceptions of (a) need for mental health services, (b) modifying factors, and (c) barriers to accessing services. Data were transcribed verbatim, content coded, and analyzed for emergent themes. **Results:** Twenty-nine youth, ages 18-27 years old, participated in the focus groups; 72% were unemployed, 44% were on disability, and 21% were uninsured. Youth indicated problematic functioning secondary to mental health problems in the following domains: sleep, anger management, and ability to maintain jobs and relationships. Youth described a general need for mental health services with differences in perceived need for psychotherapy vs psychotropic medication. Despite a perceived need for mental health services, youth identified several barriers to accessing services: difficulty obtaining health insurance, difficulty finding a mental health provider and establishing a therapeutic relationship, excessive wait times at appointments, conflicting priorities, and lack of reliable transportation. Transition related issues were also reported, including a lack of preparation for independent living and a sudden loss of support for managing mental health needs. **Conclusion:** The findings reinforce that youth transitioning out of foster care perceive that (1) mental health problems impact their functioning in multiple areas, and (2) they need mental health services. Transition planning that actively educates youth about insurance and system issues and engages them in the development of treatment goals and provider identification may ensure developmentally

appropriate transition of mental health services.

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## **Abstract 68**

### **Child and Family Characteristics Associated with Age of Diagnosis of an Autism Spectrum Disorder in a Tertiary Care Setting**

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*Bridgemohan, MD, Noelle L. Huntington, PhD, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA*

**Purpose:** Identify child and family characteristics associated with age of diagnosis of an Autism Spectrum Disorder (ASD) in a tertiary care setting. **Methods:** We conducted a chart review of children who received their first ASD diagnosis in our clinic from 2007-2011. Child variables included gender, birth order, and nonverbal IQ, for all subjects, and language and adaptive assessments, available only for children <36 months. Family variables included insurance, maternal age, maternal education, sibling or extended family member with ASD, and number of children in the house. Primary outcome was age of ASD diagnosis. We ran models with child variables only, family variables only, and child and family variables together to examine the unique and combined contributions of child and family characteristics. **Results:** 592 participants (Autistic Disorder 45.1%, PDD, NOS 54.7%) met inclusion criteria. Too few children with Asperger's were available in the study period to allow inclusion in the analyses. Median age of diagnosis was 2.9yrs (mean 3.9yrs; range 15mo-13.8yrs). In the total sample, multiple regression of child variables only was not significant ( $R^2=.003$ ;  $p=.73$ ); models of family variables only ( $R^2=.12$ ;  $p<.001$ ) and child/family combined ( $R^2=.18$ ;  $p<.001$ ) were significant. In the combined model, significant predictors of later age of diagnosis were earlier birth order, lower maternal education, more children in the house, and no sibling with ASD. In a separate analysis of children < 36 months of age ( $n=315$ ), a model of child variables only (including language and adaptive assessments) was significant ( $R^2=.44$ ;  $p<.001$ ). Models of family variables or child/family combined were too unstable due to missing data. Significant child predictors of later age of diagnosis were lower nonverbal IQ, lower adaptive functioning, and higher receptive and expressive language. **Conclusion:** This study highlights the role of family characteristics in age of diagnosis, emphasizing the importance of carefully monitoring children from less advantaged families. A more age-varied sample is needed to further evaluate the role of child characteristics.

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## Abstract 69

### Teachers' Perceived Burden of Having a Child with Asthma: Differences Based Upon School Locale

*Aimee W. Smith, MA, Beth Wildman, PhD, Psychology, Kent State University, Kent, OH*

**Purpose:** Teacher perception of a child in the classroom affects that child's outcome. School resources are often insufficient to meet the needs of children with chronic health conditions. The disparity between child need and available resources is greater in poorer school districts and rural areas, often where behavioral health professionals are not available. We evaluated the relationship between teachers' knowledge of asthma and their subjective level of comfort and burden of having children with asthma in their classroom based upon school locale (suburban, rural, urban). **Methods:** 65 teachers recruited via email completed a questionnaire assessing attitudes toward and knowledge about children with asthma. Participants were mostly female (88%) and teaching for more than 10 years (80%). **Results:** HLM using restricted maximum likelihood found different levels of burden based upon school locale. Teachers in rural schools report the highest mean level of burden ( $M = 2.75$ ,  $SD = 1.42$ ), followed by teachers in urban schools ( $M = 2.25$ ,  $SD = 1.36$ ) and teachers in suburban schools reporting the lowest ( $M = 1.78$ ,  $SD = 1.14$ ). Neither knowledge nor comfort was related to perceived burden. **Conclusion:** A school's locale is related to teachers' perceived burden. Teacher knowledge did not contribute to burden, suggesting school resources need to be considered when considering care and safety of children with asthma in schools. Future research should include ways to provide more support to teachers, either in person or via telemedicine. This research needs to determine what types of services are needed to decrease teachers' perceived burden.

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## Abstract 70

### What Makes Teachers Willing to Accommodate Children with Health Conditions in the Classroom?

*Aimee W. Smith, MA, Shana Wilson, MA, Beth Wildman, PhD, Psychology, Kent State University, Kent, OH*

**Purpose:** Children with developmental and behavioral disorders often require accommodations in the classroom. However, teachers' willingness to enact those accommodations can vary. We evaluated the relationship between teachers' reported burden of an accommodation and their reported willingness to enact that accommodation. Additionally, we predicted the teacher's perceived benefit of the accommodation for the child would moderate that relationship. Eight accommodations were examined:

Allowing missed class time for support services, Educating classmates about the condition, Encourage socialization with child, Assigning a partner to assist, Attending educational classes about special needs, Consider complications from condition before punishing behavior, Provide extra instructions for substitutes, and Dealing with negative reactions of parents of other children.

**Methods:** 124 teachers recruited via email completed a questionnaire assessing attitudes toward accommodating children with various health conditions. Participants were mostly female (88%) and teaching for more than 10 years (80%). **Results:** Separate linear regressions were conducted for each accommodation. For all accommodations examined, teacher reported burden of an accommodation predicted willingness to use the accommodation. For four accommodations, this relationship was moderated by teacher-reported benefit for the child (all  $p$ s < .05). For teachers who strongly agreed with the statement "this could greatly benefit a child", the relationship between burden and willingness was attenuated. **Conclusion:** Teachers who have children with health conditions in their classroom oftentimes must enact accommodations for those children. This study highlights that (1) teacher's perceived burden of the accommodation and, (2) for some accommodations, the teacher's perception of the benefit of the accommodation impact teacher willingness to enact the accommodation. Providers who work with children with health conditions can play an important role in communicating with school personnel about the likely beneficial impact of accommodations and can problem solve ways to decrease the burden of implementing these accommodations.

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## Abstract 71

### Comparison of Developmental Screening Methods and How They Affect Pediatric Resident's Learning of Developmental Milestones

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**Purpose:** During pediatric residency, residents are trained to identify developmental delay in children by knowing developmental milestones, listening to parental concerns, and using developmental screening tools. Denver II is a screening tool that is primarily based upon an examiner's actual observation while the PEDS (Parents' Evaluation of Developmental Status) relies on parental report. The goals of the present study were to determine the effects of developmental screening tools on (1) the learning of developmental milestones, and (2) the comfort in performing developmental surveillance. **Methods:** Sixteen PGY-1 pediatric residents were randomly divided into two equal groups. One group used the Denver II, while the other used the PEDS for developmental screening during well-child visits at their continuity clinic site. The Developmental Milestone Test (DMT) was developed to measure knowledge of child development focusing on ages 9 to 36 months. The Comfort Questionnaire (CQ) surveyed how comfortable residents were in performing developmental screening at different ages. The DMT and CQ were administered in June 2012 and administered again 10 months post-intervention. **Results:** Pre-intervention scores on both the DMT and CQ were not significantly different. However, significant difference was found between Pre- and Post-Test scores for the PEDS group ( $p < 0.02$ ), but not for the Denver II group. In addition, a significant difference was found between the PEDS and Denver II groups on the Post-Test scores with the PEDS group scores higher than the Denver II ( $p < 0.001$ ). No significant difference was found between the Pre- and Post-Intervention CQ scores measuring how comfortable residents feel in assessing normal development at different ages, although CQ scores for all groups increased from pre- to post-intervention. No significant correlation was found between Post-Intervention CQ scores and DMT scores (Pearson  $r = -0.058$ ,  $p < 0.83$ ). **Conclusion:** The residents utilizing the PEDS screening tool over 10 months scored significantly higher on a test of developmental knowledge when compared to residents using the Denver II. Residents' judgments of their comfort level with developmental screening were not significantly correlated with actual knowledge scores. Perhaps, the ease of PEDS administration led residents to screen more patients during the year.

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## Abstract 72

### Trifecta for Breastfeeding: An Interdisciplinary, Integrated Health Model of Breastfeeding Management

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**Purpose:** The breastfeeding relationship is often complicated by challenges that are difficult for pediatricians alone to treat. As a result, we developed a multidisciplinary team: pediatrician, lactation consultant, and psychologist. This Trifecta meets families' needs by addressing the infant's medical care, functional breastfeeding challenges, and the developing mother-infant relationship, plus screening of concurrent pregnancy-related mood disorders. Program evaluation objectives include characterization of the population served by the Trifecta, and analysis of screening and patient satisfaction data. **Methods:** Prospective surveys were administered to mothers at initial clinic visits between 8/12-4/13. Survey measures included caregiver stress rating, duration of breastfeeding intent, Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF), Edinburgh Postnatal Depression Scale (EPDS), Maternal-to-Infant Bonding Scale, and Infant Feeding Intentions. A post-visit satisfaction survey was administered by phone. Data also include sociodemographic characteristics, screening results, and patient satisfaction. **Results:** Sixty two infants (52% female) presented to clinic ranging from four days to nine months. Mothers' average stress rating was 3.06 (SD=1.05), on 1-5 scale, and EPDS scores ranged from 0-24 with a mean of 6.93 (SD=5.10). Respondents generally reported feeling loving (94%), joyful (74%) and protective (84%) towards their babies. On average, mothers reported intent to breastfeed for 10.29 months (SD=3.98). BSES-SF scores ranged from 25-60 (0-64 confidence scale). Sixty nine percent (N=43) of mothers completed follow-up surveys. Average infant age at follow-up was 8.7 months, 63% (N=27) of mothers were still breastfeeding, and 88% (N=38) reported that the visit helped meet their goals. Ninety eight percent (N=42) plan to breastfeed again with another child. 100% of families were highly satisfied with their experience with the Trifecta model, and 100% responded that they were highly likely to recommend the clinic to others. **Conclusion:** Initial program descriptive results highlight the challenges that arise for families of breastfed infants. An integrated health approach to breastfeeding management may help to decrease maternal stress and pregnancy-related mood disorders and increase maternal competence, confidence and breastfeeding duration to promote long-term infant health.

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## **Abstract 73**

### **Gross Motor Function Improves in Young Children with Spastic Cerebral Palsy After Myofascial Structural Integration Therapy**

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**Purpose:** To assess whether Myofascial Structural Integration (MSI), a complementary therapy that is also known as Rolfing Structural Integration and is similar to deep tissue massage, improves gross motor function in children with spastic cerebral palsy (CP). **Methods:** The study is a randomized controlled trial (RCT) with a subsequent open label (OL) crossover design. Children ages 4 and under with a diagnosis of spastic cerebral palsy were enrolled. Participants continued pre-existing treatments without change. Recent injection of botulinum toxin was an exclusion criterion. Children were assigned to treatment (n=7) or waitlist-control group (n=6). All of the children (N=13, pooled sample) were assessed at baseline, pre-treatment, and post-treatment. Study intervention was a standard course of MSI, performed weekly for ten weeks by one clinician. An evaluator, blind to treatment phase, assessed response to treatment. Primary outcome measure was the Gross Motor Function Measure -66 (GMFM), a standardized measure of gross motor function for children with a diagnosis of CP. For this age and degree of disease-involvement, the anticipated GMFM score range is 20-90, with higher scores indicating higher function. **Results:** In RCT phase, repeated measures ANOVA indicated that, though group difference in GMFM scores suggests possible treatment benefit (i.e., treatment group post-treatment M=48.40 vs. control group pre-treatment M=46.41), the difference was not statistically significant (p=0.13). In the OL phase, using the pooled sample, paired t-test analysis showed no significant change in GMFM score comparing baseline to pre-treatment assessments (M=45.41 and M=46.35, p=0.40). The change in GMFM score from pre-treatment to post-treatment assessments was statistically significant (M=46.35 and M=48.29, p=0.04). **Conclusion:** Ten weekly sessions of myofascial structural integration therapy was associated with better Gross Motor Function Measure scores in young children with spastic cerebral palsy. Though the magnitude of change was modest, it was associated with parental qualitative impressions of clinical improvement.

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## **Abstract 74**

### **Lower-Socioeconomic-Status Mexican-American Adolescent's Exposure to Violence, Alcohol, and Drugs and Their Psychosocial and Behavioral Profile**

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**Purpose:**To determine lower socioeconomic status adolescents self-report exposure to violence, drugs and alcohol and their psychosocial and behavioral profile. **Methods:**Extracted information data corresponded to a sample of Mexican-American adolescents, who responded to the Guidelines for Adolescent Preventative Services questionnaire (GAPS), and their parents, who responded to the Child Behavior Checklist (CBCL). A total of 881 records were extracted, including 463 (52.6%) females (median age 13.2; standard deviation = 1.7). Categories of exposure were formulated by extracting questions on the GAPS and linked to psychosocial and behavioral problems resulting reported by the parent's report about the youth's behavior. **Results:**Based on the adolescents self-report extracted questions on the GAPS groups were categorized into uninvolved adolescents 463(52.6%).The remaining 418 adolescents were categorized into exposed only to violence 25.1%, alcohol 24.9% and drugs 8.6%, combined exposures to violence and alcohol (13.4%),alcohol and drugs (14.6%) and violence, alcohol and drugs (13.4%).Combinations of exposures showed an additive effect in the psychosocial and behavioral profile of adolescents. **Conclusion:** The results of this study indicate the additive, detrimental effect on the psychosocial and behavioral profile of the adolescents with combined exposure to violence, alcohol, and drugs. Our results strongly suggest that using these screening questions in a clinical, non-emergency setting can increase early detection of current or potential problems and allow for an early intervention.