

Abstracts of Plenary Sessions and Posters Accepted for Presentation at the 2010 Annual Meeting of the Society for Developmental and Behavioral Pediatrics

Plenary Sessions

Abstract 1

Incidence of Attention-Deficit/Hyperactivity Disorder (ADHD) and Learning Disabilities (LD) in Late Preterm Infants in a Population-Based Birth Cohort

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Purpose: Previous studies using primarily referred clinical samples that have followed children only until early school age have reported that late preterm infants have an increased risk of learning and behavioral problems compared to term infants. Our objective was to determine the cumulative incidence of ADHD and LD in reading, written language, and math in late preterm infants (born 34-<37 weeks) through 19 years of age in a population-based birth cohort. **Methods:** Subjects included all children born 1976-1982 in Rochester, MN, with gestational age available from electronic birth certificate data, and who remained in the community after age 5 years (N=5316). Children were divided into late preterm (34-<37 weeks) and term (37-<41 weeks) groups based on gestational age at birth. Records from all public/private schools and all sources of medical care were available to identify individuals who met pre-determined research criteria for ADHD and LD in reading, written language, and math. The Kaplan-Meier method was used to estimate the cumulative incidence of each disability; subjects were censored at the earliest occurrence of moving, death, or age 19. P-values are reported from Cox proportional hazards models that were fit to evaluate the association between gestational age category (late preterm vs. term) and disability, after adjusting for birthweight and maternal age. **Results:** We found no statistically significant differences in the cumulative incidence of any disability between the late preterm (N = 256) versus term (N = 3568) groups: ADHD (late preterm 6.7% vs. term 6.1% by 19 years of age; $p = 0.72$); Reading LD (late preterm 12.2% vs. term 10.9% by 19 years; $p = 0.47$); Written Language LD (late preterm 11.4% vs. term 12.7% by 19 years; $p = 0.74$); or Math LD (late preterm 13.7% vs. term 12.7% by 19 years; $p = 0.89$). **Conclusion:** Contrary to previous reports, these data from a population-based birth cohort indicate that late preterm infants have similar rates of ADHD and learning disabilities compared to term infants.

Abstract 2

Screen Time Use in Children with Autism Spectrum Disorders Compared to Typical Peers

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Purpose: Increased screen time is a known contributor to childhood obesity and its co-morbidities. The American Academy of Pediatrics recommends limitation of total media to 2 hours or less per day. To date there has been little study of screen use by children with ASD. The social deficits and repetitive behaviors inherent in ASD may make screen use more appealing to these children, and may place this population at risk for excessive screen use. **Methods:** Parents of children ages 2-11 years (Mean age=6.4 years, SD=2.77, 66.9 % male), receiving care at a large, Midwestern Hospital were surveyed regarding their child's television and video game use, and physical activity for the typical school and weekend day, and age of initial interest in screen media. Data regarding height and weight was also collected. The sample included 100 parents of children without developmental concerns and 72 parents of children with ASD. **Results:** ASD subjects had greater daily screen use compared to typical peers, with

a statistically significant ($p=0.024$) mean difference of 0.7 hours per day. The majority of all participants exceeded AAP screen recommendations with (75% of ASD and 67% of typical subjects; with average daily screen use of 3.76 and 3.06 hours respectively). When television and video game use were separately compared, there was no significant difference between groups for weekend television and all video game use. For school day television, ASD subjects had statistically significant ($p=0.008$) greater use, with a mean difference of 0.54 hours. For physical activity, there was no significant difference between groups for school days, but significantly more reported physical activity on weekend days ($p<.001$, mean difference 1.3 hours) for developmentally typical subjects.

Conclusion: This study provides evidence to support the need for additional intervention to decrease screen use for all children. It also supports the concern that children with ASD are at greater risk for excessive screen use, and low levels of physical activity. Thus this population would likely benefit from increased guidance by medical providers to parents regarding screen use.

Abstract 3

Increased Prevalence of Seizures, ASD, and ADHD in Boys with the Fragile X Premutation

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Purpose: Expansions in the FMR1 gene between 55-200 CGG repeats are known as the premutation range of fragile X which is relatively more common than the full mutation (> 200 CGG repeats). However, developmental, behavioral, and neuropsychological involvement in young individuals with the premutation remains uncertain across studies. Our study compares the prevalence of clinical involvement in young males with the premutation who participated in research in our clinic with non-probands and non-carrier male controls. **Methods:** Twenty one young males who presented clinically (probands), 19 males who were identified by cascade evaluation and did not present clinically (non-probands), and 33 typical male siblings without the FMR1 mutations were enrolled. Developmental, behavioral, and neuropsychological domains were assessed by appropriate measures. **Results:** Mean age of the probands (8.71 ± 4.48 years), non-probands (9.38 ± 4.48 years), and non-carrier male controls (9.63 ± 5.37) were similar among groups ($p = 0.733$). Cognitive and adaptive functioning was significantly higher in non-probands than in probands, but not higher than controls. The prevalence of autism spectrum disorders (ASD) was significantly higher in probands than in non-probands (66.7% vs. 26.3%, $p = 0.011$). The non-probands were more likely to be diagnosed with ASD (26.3% vs. 0%, $p = 0.046$) and attention deficit hyperactivity disorders (ADHD) (50% vs. 12.5%, $p = 0.02$) than controls. Furthermore, in those premutation carriers who have also had ASD together were more likely to have seizures (31.6% vs. 5.0%, $p = 0.044$), and ADHD (81.3% vs. 50%, $p = 0.031$); than those with premutation carriers alone. **Conclusion:** Boys with the fragile X premutation should be screened for seizures, ASD, and ADHD even if they do not present clinically. Furthermore, fragile X DNA testing should be highly recommended in those with ASD with and without other neurodevelopmental problems. Combined data of the premutation carriers from multi-sites of fragile X clinics is needed to examine this relevant clinical involvement further in order to improve the plan for optimal treatment and intervention.

Abstract 4

Disruptive neural response during rapid auditory processing in pre-readers at risk for dyslexia - an fMRI study

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Purpose: Developmental dyslexia (DD) is a specific learning disability characterized by difficulties with accurate and/or fluent word recognition, and poor spelling and decoding. Familial occurrences support a genetic basis for DD. The earliest predictors of future reading success include speech processing in infancy; event-related brain potentials during rapid auditory processing, and phonological skills. However, differences in whole-brain functional networks in pre-reading children at risk for DD remain unexamined. The goal of this study is to investigate possible neural and behavioral pre-markers of DD in pre-reading children with (FHD+) and without (FHD-) a family-history of DD. **Methods:** 31 right-handed children (17 FHD+/14 FHD-; 5.5y) completed standardized psychometric testing. Functional magnetic resonance imaging was performed during rapid auditory processing. Stimuli were non-linguistic with a spectro-temporal structure comparable to that of consonant-vowel-consonant speech syllables, with either rapid or slowed frequency transitions. Participants were instructed to indicate the pitch of the stimulus. Random-effects analyses for rapid versus slow transitions were performed. **Results:** FHD+ children, compared to FHD- children, showed significantly reduced expressive language, phonological processing and rapid naming skills. Performance inside the MR scanner indicated no significant group differences for pitch identification. However, preliminary imaging results directly comparing the two groups showed increased activation (FHD- > FHD+) in various brain areas including left prefrontal, bilateral auditory and bilateral inferior parietal regions. **Conclusion:** Our results suggest that pre-reading children with a family history of DD already show a disrupted response to rapid acoustic stimuli in similar brain regions as children and adults with a diagnosis of DD. A longitudinal follow-up study will determine whether these early differences in brain function can predict reading outcome. An early identification of children at risk is essential for developing and improving intervention programs which may prevent negative clinical, psychological and social outcomes of DD.

Abstract 5

Arbaclofen Treatment Is Associated with Global Behavioral Improvement in Fragile X Syndrome (FXS): Results of a Randomized, Controlled Phase 2 Trial

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Purpose: To explore the safety and efficacy of arbaclofen for behavioral symptoms in FXS. Arbaclofen, a GABA-B agonist, is one of the first targeted treatments for a neurodevelopmental disorder. The rationale for its testing in FXS include data from animal models of FXS, and the anecdotal clinical use of racemic baclofen in FXS. **Methods:** Double-blind, placebo-controlled, crossover, multisite trial. 63 subjects with FXS, ages 6-40 yrs, and who met severity criteria on the Aberrant Behavior Checklist - Irritability (ABC-I) subscale were enrolled. Arbaclofen was flexibly titrated over 2 weeks, then continued for 4 weeks at the optimal titrated dose. Up to 3 concomitant psychoactive medications were allowed. This research was supported by Seaside Therapeutics, Inc. **Results:** 49 subjects completed the study and had no major protocol deviations. In this group, clinicians ($p=0.05$) and parents ($p<0.10$) both reported a blinded preference for arbaclofen vs. placebo. These results were more robust among pediatric subjects who met criteria for autism ($p<0.01$). Similarly, significantly more subjects were responders on the CGI-I scale when receiving arbaclofen vs. placebo (35% vs 18% overall, 50% vs. 6% in the autism group). The ABC-I scale was not sensitive to these effects. However, a post-hoc analysis showed that subjects with higher ABC-Social Withdrawal baseline scores had significant improvement on that scale, consistent with parent reports of improved socialization and communication. Arbaclofen was very well-tolerated. A majority of subjects enrolled in an open-label extension study, and some have withdrawn from concomitant antipsychotic treatment. **Conclusion:** Arbaclofen shows significant potential for the treatment of behavioral symptoms in FXS, and possibly for the treatment of core social symptoms in autism.

Abstract 6

Pharmacogenetics of Methylphenidate Response in Attention-Deficit/Hyperactivity

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Purpose: Due to significant individual variability in ADHD medication response, there is increasing interest in identifying genetic predictors of treatment effects. This study examines the role of catecholamine-related candidate genes in moderating ADHD treatment response. **Methods:** 89 stimulant-naïve children with ADHD aged 7-11 participated in a prospective, randomized, double-blind, 4-week crossover trial of long-acting methylphenidate (MPH). Parents and teachers assessed each child's response on placebo and three MPH dosages via the Vanderbilt ADHD rating scales. Participant saliva samples were genotyped. Linear mixed models evaluated gene, dose (mg/kg/day), and gene*dose effects on hyperactive-impulsive (HI) domain and inattentive (IA) domain symptom scores, adjusting for IQ, subtype, mental health comorbidities, and a rater variable (to accommodate both parent and teacher ratings in the same model). **Results:** A main effect on HI domain scores was detected for an adrenergic alpha-2A receptor (ADRA2A) promoter polymorphism, with G allele homozygotes having higher levels of symptoms on placebo and across MPH doses ($p=0.025$). Gene*dose interactions were seen on the HI domain for dopamine receptor D4 (DRD4) exon 3 and catechol-O-methyltransferase (COMT) codon 158 polymorphisms, with those lacking the DRD4 4-repeat showing less improvement across MPH doses compared to those carrying a 4-repeat ($p=0.037$), and COMT val allele homozygotes experiencing greater improvement with increasing doses compared to other groups ($p=0.048$). No significant effects were observed for the dopamine transporter, norepinephrine transporter, or synaptosomal-associated protein-25 on either symptom domain, or for ADRA2A, DRD4, or COMT on the IA domain. **Conclusion:** This study suggests three catecholamine-related genetic variants that may influence ADHD medication response, although more research is needed to confirm the clinical utility of our findings.

Abstract 7

White Matter Characteristics Correlate with Executive Function Skills in Preterm and Full-term Children

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Purpose: Executive function (EF) skills are an interrelated set of abilities that include working memory, organization and planning. Preterm children have difficulties with EF skills compared to full-term peers. Diffuse white matter injury in preterm children is common. Little is known about the relationship between white matter injury and EF problems in preterm children. **Methods:** Preterms ($n=19$, mean age 11.9 yr) and controls ($n=15$, mean age 13.4 yr) were assessed on the CANTAB, a computerized EF battery. Outcome measures for each task: Spatial Working Memory (SWM, working memory for spatial location) strategy score; Stockings of Cambridge (SOC, a complex measure of spatial planning, organization and response inhibition) problems solved in minimum moves (PS); Spatial Span (SSP, a measure of spatial memory capacity) span length (SL). Four diffusion tensor imaging (DTI) acquisitions of 60, 2mm-thick slices were collected in 30 different diffusion directions ($b = 900$). DTI data were pre-processed with FSL Diffusion Toolbox. Tract-Based Spatial Statistics based on fractional anisotropy (FA) defined the centers of major white matter tracts throughout the brain. We evaluated correlations between FA of these tracts and EF skills, covarying by age. We set $p < .05$ after correcting for multiple comparisons. **Results:** Preterm and control groups did not differ in FA; however, EF skills were correlated with FA. SWM strategy was negatively correlated with FA; better strategy was associated with higher FA, $p < .01$. Regions of significant correlation include corpus callosum (CC), bilateral (B) superior longitudinal fasciculus (SLF), and B inferior fronto-occipital fasciculus

(IFOF). SOC PS was positively correlated with FA; better overall performance on a complex EF task was associated with higher FA, $p < .05$. Significant regions include CC, B SLF, and B IFOF. SSP SL showed a trend for positive correlation with FA, $p < .09$. **Conclusion:** Preterm and full term children show significant associations between EF skills and white matter microstructure in multiple brain regions. These regions include long tracts which run from posterior temporal and occipital regions to frontal regions implicated in EF. Though preterm children as a group did not have obvious white matter damage compared to full-term controls, a measure of white matter microstructure was sensitive to individual differences in EF in children and adolescents.

Abstract 8

The Developmental Course of Attention-Deficit/Hyperactivity Disorder (ADHD): Results from a Prospective, Population-Based Study

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Purpose: Previous research on the developmental course of ADHD, including the rate of persistence of ADHD into adulthood, has been limited to biased samples. Estimated rates of persistence of ADHD into adulthood have varied widely. The developmental course of ADHD therefore remains uncertain. The objective of this study is to determine the rate of persistence of ADHD into adulthood among all incident cases of research-identified childhood ADHD from a population-based birth cohort. **Methods:** Subjects from a 1976-1982 birth cohort (N=5699), including those with research-identified childhood ADHD (N=379) and non-ADHD controls, were invited to participate as young adults in a research study that included a DSM-IV based, structured, diagnostic interview (MINI International Neuropsychiatric Interview). Participating subjects included young adults with research-identified childhood ADHD (N=231; mean age 27.0 years; 166 males, 65 females). Controls (N=335; mean age 28.6 years; 210 males, 125 females) included young adults from the same birth cohort. Adult ADHD was defined from the MINI ADHD module as item endorsements exceeding 2 standard deviations above the mean for the *control subjects and* endorsement of the statement indicating that symptoms were having a significant, negative impact in two or more settings. **Results:** Among the 231 childhood incident cases of ADHD, 67 fulfilled criteria for adult ADHD (29.0%, 95% CI 23.2-34.9). Rates of persistent ADHD were similar for males (28.9%, 95% CI 22.2-35.8) and females (29.2%, 95% CI 18.2-40.3). If the requirement that subjects report significant negative impact of symptoms were disregarded, the rate of persistent ADHD would be 38.5% (95% CI 32.3-44.8). **Conclusion:** This is the first prospective, population-based study of the rate of persistence of ADHD into adulthood. A significant percentage of adults with a history of childhood ADHD will continue to manifest a sufficient number of ADHD symptoms to exceed a population-based diagnostic threshold. This finding provides a more precise description of the developmental course of ADHD and highlights the importance of careful, longitudinal follow-up and treatment for all individuals with ADHD.

Abstract 9

A randomized trial of Teen Online Problem Solving to Improve Behavior and Executive Functioning following Adolescent Brain Injury

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Purpose: Traumatic brain injury is a leading cause of long-term morbidity in adolescence resulting in executive dysfunction, behavior problems, and impaired social adjustment. We report results from a randomized clinical trial (RCT) of Teen Online Problem Solving (TOPS) in improving behavioral outcomes of adolescent TBI. **Methods:** RCT comparing the efficacy of TOPS to access to internet resources regarding TBI (IRC) in improving parent and self-reported executive function (EF) and behavior problems. Individuals in TOPS received 10-14 online sessions providing training in problem solving, communication skills, and self-regulation. EF and behavior problems were assessed at baseline and at a follow-up assessment an average of 7 months later. Injury severity and socioeconomic status (SES) were examined as potential moderators of treatment efficacy by examining their interactions with treatment group status. **Results:** Twenty-one participants were randomly assigned to TOPS and 21 were assigned to the IRC group with follow-up assessments completed on 35 participants. Improvements in teen EF and behavior following TOPS were moderated by injury severity. Teens with severe TBI reported significantly greater improvements in self-reported EF skills and their parents reported greater reductions in internalizing symptoms such as anxiety and depression following TOPS versus IRC. Family SES also moderated the efficacy of TOPS in improving both parent and teen reported behavior problems. Parents reported greater improvements in externalizing symptoms among children with lower SES following the TOPS treatment. Conversely, adolescents of higher SES in the TOPS group reported greater improvements in externalizing symptoms than those in the IRC group, whereas no group differences were found among adolescents of lower SES. **Conclusion:** The findings suggest that TOPS contributes to improvements in parent and self-reported behavior problems following adolescent TBI for certain subsets of participants. Differences between parent and teen perceptions underscore the need to assess outcomes from multiple perspectives.

Abstract 10

Cumulative Infant/Toddler Media Exposure Adversely Associated with Self-Regulation at 3 Years

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Purpose: Self-regulation is critical for school readiness and educational achievement. We sought to determine whether media exposure in at-risk low socioeconomic status (SES) infants/toddlers was adversely associated with self-regulation at 3 yrs. **Methods:** Longitudinal analysis of mother-infant dyads followed from birth-36m as part of larger study. Inclusion criteria: English/Spanish language, no medical complications. Independent variable: Electronic media exposure (6,14,24,36m): 24-hr recall diary, with cumulative exposure based on sum of 4 time points; primary study variable was media reported to be watched by child. Dependent variables (3yrs): 1) Executive functions: Working memory (CELF Preschool-2 Recalling sentences); Inhibitory Control (IC; Spatial conflict task); 2) Sustained attention: Preschool Self-Regulation Assessment (PSRA-observation); 3) Hyperactivity (Behavior Assessment System for Children; BASC-2). Potential confounders: maternal depression (PHQ-9), temperament (STSI), cognitive stimulation (StimQ), sociodemographics. **Results:** 95 dyads with media assessments at all 4 times were included in analyses. Mothers: 35% HS grads; 93% Latina. Mean(sd) cumulative media exposure 538(324)mins, with 369(249)mins watched by child. Cumulative exposure watched by child was associated with reduced working memory/attention and increased hyperactivity in both unadjusted analyses and multiple regressions adjusting for all confounders (See Table). High cumulative exposure (>360 mins) associated with increased hyperactivity in "at risk" range (64 vs. 41%, chi-sq=4.0, p<.05; Adj OR 2.7, 95% CI 1.0, 7.2). Associations not seen for IC. **Conclusion:** Cumulative media exposure from 6-36m was adversely associated with self-regulation. Interventions to enhance school readiness and educational outcomes should address early media exposure in the home. Funding: SDBP Research Grant, NICHD(R01 HD047740), Tiger Foundation, Marks Family Foundation, Children of Bellevue, Inc., KiDS of NYU.

Associations between cumulative media exposure & self-regulation

	Working memory (CELF)	Attention (PSRA)	Hyperactivity (BASC)
Unadjusted (r)	-.22*	-.20*	.19t
Adjusted (beta)	-.23*	-.19t	.17t
*p<.05; t: p<.10			

Abstract 11

Behavioral Effects of Testosterone Therapy in Adolescents with Klinefelter Syndrome/XXY, XXYY, and XXXY: Interim Study Results

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Purpose: Males with supernumerary X chromosomes share a phenotype that includes the development of primary hypogonadism (testosterone deficiency) in adolescence, leading to the need for testosterone replacement therapy (TRT). Males with Klinefelter syndrome (KS/XXY), XXYY, and XXXY also have increased risks for language-based cognitive impairments and neurodevelopmental or behavioral disorders, which are more significant in the tetrasomy conditions (XXYY, XXXY) compared to KS/XXY. The psychological and behavioral effects of TRT have not been well studied in these patients. Here we present interim behavioral results from a pilot study evaluating changes in neuropsychological function and behavior before and after testosterone therapy in adolescent males with KS/XXY, XXYY, and XXXY. **Methods:** A convenience sample of 23 participants starting on testosterone therapy have been enrolled to date (10 XXY, 10 XXYY, 3 XXXY), and 14 have completed 12 months of therapy. The Behavior Assessment System for Children-2 (BASC-2) parent-report and self-report were collected as part of the battery at baseline and after 12 months, and results on the subscales of externalizing behavior, internalizing behavior, attentional problems, and adaptive scales were analyzed by paired t-test. **Results:** Preliminary results of the parent-report BASC-2 show significant improvements attentional symptoms ($p=0.02$), a trend toward improvements in internalizing symptoms ($p=0.08$), and no differences in externalizing behaviors ($p=0.82$) or adaptive skills ($p=0.32$) following 1 year of TRT. There were no significant differences in self-report BASC-2 scores. **Conclusion:** TRT may improve attentional skills, and did not lead to worsening of behavioral problems in KS/XXY, XXYY, or XXXY. Final study results including more detailed analysis of neuropsychological, motor skills, and behavior are pending, but suggest that a placebo controlled trial is an important next step.

Abstract 12

Can Family Characteristics Counteract the Negative Effects of Stigmatization?

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Purpose: The purpose of the study is to test factors within lesbian families that may counteract the hypothesized negative effects of stigmatization on adolescents adjustment. **Methods:** This analysis is based on the 5th wave of the USA National Longitudinal Lesbian Family Study (NLLFS). The data were collected through online questionnaires completed by 78 adolescents ($M=17$ years, $SD=.36$) and their birthmothers ($n=77$, $M=52$ years, $SD=3.89$). Stigmatization was assessed through the question: Have you been treated unfairly because of having (a) lesbian mom(s)? Items from the Adolescent Quality of Life Scale assessed family connection: How many days did the family eat dinner together during the previous week?, and family compatibility: I feel I am getting along with

my parents or guardians. Family preparation for stigmatization was measured by the question: Has (have) your mother(s) done anything to help prepare you in case you are treated badly because of having (a) lesbian mother(s)?. Birth mothers completed the Child Behavior Checklist. A hierarchical multiple-regression analysis was conducted, with CBCL total problem behavior as the outcome variable. Reported experience of stigmatization was entered in Step 1. Family connection, family compatibility, and family preparation were entered in Step 2. **Results:** 41% of the adolescents reported having experienced stigmatization because of their mothers' sexual orientation. In Step 1, the experience of stigmatization predicted total problem behavior $R^2 = .11$, $F(1, 66) = 7.72$, $p < .01$. Including family connection, family compatibility, and family preparation for stigmatization in Step 2 produced a significant change in R^2 ($R^2 = .19$, $F(1, 63) = 6.43$, $p < .001$). Only family compatibility was significantly related to total problem behavior. **Conclusion:** The results indicate that although reported stigmatization was associated with more problem behavior, family compatibility neutralized this negative influence. Having a close, positive relationship with their lesbian mothers provided adolescents resilience in response to stigmatization.

Abstract 13

Communicating with Parents about Developmental Screening in Primary Care

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Purpose: Revised AAP guidelines on developmental screening (DS) (2006) are likely to increase use of systematic screening in primary care. Little literature exists to guide providers in communicating about the purpose and results of DS tests with families. We sought to develop such recommendations. **Methods:** Semi-structured interviews were conducted with 15 experts nominated by 10 national organizations in relevant fields to develop initial recommendations. Focus groups were then conducted with parents of children in Early Intervention (EI) (4 groups, 27 parents), parents of children who had not received EI services (4 groups, 20 parents) and primary care providers (4 groups, 17 providers) to refine recommendations. Interviews and focus groups were audio-recorded and transcribed. Transcripts were coded by 2 raters to identify themes and recommendations. **Results:** In preparing families for DS, experts, parents, and most providers recommended communicating explicitly to all families that DS is a routine part of practice. In communicating DS results for a failed screen, experts recommended: a) gauging families' level of awareness of the suspected problem, b) emphasizing strengths, and c) communicating the utility and limitations of screens. Themes from parent groups included: a) the importance of rapport with the provider, b) that parents were likely to feel blamed if their child was not meeting milestones, c) that providers let parents know that developmental delays are common ("you are not alone"), and d) that screens be described as a "first step." Themes from provider groups included: a) that parents' awareness of a delay was an important factor in tailoring communication, and b) surprise that parents may feel blamed when children are not meeting milestones. In the choice and specificity of terms to use with families in discussing DS results, the type of diagnosis being considered and parents' concerns were cited as important considerations in tailoring communication. **Conclusion:** These recommendations can address an important barrier to implementing systematic screening, parent-provider communication, in this complex area of practice. In particular, providers' anticipation of parents' unvoiced concerns and perspectives provide an opportunity to improve communication about developmental screening.

Abstract 14

Maternal Feeding Styles Identified via Semi-Structured Interview

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Purpose: To identify maternal feeding styles from a semi-structured interview and to evaluate associations with demographics and child obesity. **Methods:** 133 mothers of preschool-aged children of diverse socioeconomic status and races/ethnicities (45 black, 44 white, 12 Asian, 32 Hispanic) participated in a semi-structured interview about their feeding beliefs and practices. Interviews were audiotaped and transcribed. Each participant was then categorized, based on their interview narrative, within: Authority (High v. Low), Emotional Investment in feeding (Deep v. Mild v. Removed), Confidence in feeding (Confident v. Conflicted v. Unopinionated) and general parenting focus and goal orientation (Interpersonal Interaction v. Moral Obedience v. Shares Limited Insight). A subset of 83 mother-child dyads participated in questionnaires, a videotaped feeding interaction, and anthropometry. Cluster analysis was used to identify maternal feeding styles based on Authority, Emotional Investment, and Confidence. Chi square and ANOVA were used to compare subject characteristics across clusters. **Results:** The 6 clusters were: Authoritative Higher Emotion, Authoritative Lower Emotion, Indulgent, Laissez-Faire, Conflicted Control and Disengaged. Cluster membership was associated with maternal race/ethnicity ($p < .0001$) and child weight status ($p < .02$) such that black mothers were more likely to be Laissez-Faire or Disengaged, white mothers Authoritative, and Hispanic mothers Indulgent. Validity for the clusters was supported by significant differences across clusters in responses to the Preschool Feeding Questionnaire ($p < .05$) as well as observed video-taped feeding interactions ($p < .05$). Children of mothers in the Conflicted Control cluster had the highest prevalence of obesity (60%) ($p < .05$). **Conclusion:** Maternal feeding styles, which extend beyond the classic four parenting styles when characterized via semi-structured interview, are associated with maternal race/ethnicity and child weight status. Healthcare providers must consider how mothers think about child feeding for effective communication.

Poster Symposium Abstracts

Abstract 15

Patient-Centered Medical Homes and Associated Outcomes for Children with ADHD

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Purpose: We aimed to determine, in a nationally representative sample of children, (1) the likelihood of having a patient-centered medical home (PCMH) for children with ADHD compared to other children with special health care needs (CSHCN), and (2) the impact of the PCMH on diagnosis, treatment, and functional outcomes for children with ADHD. **Methods:** We analyzed parent-reported data on 64,076 children ages 6-17 from the 2007 National Survey of Children's Health (NSCH). The outcome variables were: parent report of their child's primary care practice having the attributes of a PCMH, and ADHD diagnosis, ADHD treatment (medication use and mental health involvement), and functional outcomes (i.e., including participation in activities, attendance at school, and ability to make friends). Multivariate logistic regression analysis tested whether the likelihood of having a PCMH for children with ADHD differed from other CSHCN and whether having a PCMH was associated with being diagnosed with ADHD, treatment for ADHD, or functional outcomes, adjusting for child, family, and household covariates. Child covariates included depression/anxiety, learning disability, and ADHD severity. **Results:** Of children ages 6-17, 23.5% qualified as a CSHCN and 8.2% were reported currently to have ADHD. Compared to other CSHCN, significantly fewer children with ADHD had a PCMH (AOR .69, $p < .001$) and, more specifically, were less likely to have family-centered (AOR .82, $p = .05$) and coordinated care (AOR .55, $p < .001$). For those with a diagnosis of ADHD, children with a PCMH were more likely to be on medication for ADHD (AOR 1.47, $p = .02$) and less likely to have mental health involvement (AOR .54, $p < .001$). Compared to children with ADHD who did not have a PCMH, children with ADHD and a PCMH were less likely to have problem behaviors (AOR .62, $p = .003$), and less likely to have difficulties participating in activities (AOR .54, $p = .002$), attending school (AOR .32; 95% CI, .20, .51), and making friends (AOR .59, $p = .002$). **Conclusion:** These data suggest that although children with ADHD are less likely to have a PCMH than other CSHCN, those who have a PCMH experience better functional outcomes. Interventions to develop primary care practices into PCMHs should target children with ADHD in addition to CSHCN more generally.

Abstract 16

SES, Parenting, and Child Behavior are Associated with BMI in low- to middle-income Chilean and US 10- year olds

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Purpose: To examine pathways from low SES and home environment through child behavior to growth in weight, height and BMI at 10-years old in a Chilean and a US sample. Methods: The Chilean children (N=1080) were studied since infancy as part of an iron deficiency anemia preventive trial. The US children (N = 774) were selected from the National Longitudinal Study of Youth to match the entrance criteria of the Chilean cohort (low- to middle-income and birth weight \geq 3kg). Low to middle SES was categorized by tertiles. The 10-year data was collected between 2001 and 2006 in both cohorts. Analyses were conducted using path analysis. The fit indices for the tested models showed a good model fit (CFI $>$.95, NFI $>$.95, NNFI $>$.95, RMSEA $<$.05). Results: We observed similar pathways in the 2 cohorts. Sample characteristics are in table 1. Family composition, specifically number of adults in the home, showed a direct relationship with higher weight at 10 years. Lower SES (compared to middle SES) was directly associated with lower height. Belonging to the lowest SES group was also indirectly related to growth outcomes through child behavioral characteristics. Parental sensitivity and responsiveness was associated with lower child weight. This relationship was mediated by decreased risk for behavioral problems. Higher BMI was indirectly related to more adults in the home, lower SES, and poorer parental sensitivity and responsiveness. Conclusion: In both Chile and the US, we find that lower income children are at risk for higher BMI. We find similar paths from SES and home environment through behavioral characteristics to BMI in Chile and the US. Parental responsiveness and sensitivity played an important role in both contexts.

Table 1. Sample characteristics for Chilean and U.S. children

Variables	Chile (n=1080)	NLSY (n=774)
	Mean (SD) or %	Mean (SD) or %
Height for age percentile	49 (27)	60 (32)
Weight for age percentile	63 (28)	65 (31)
BMI percentile	70 (26)	66 (32)
Overweight/obese (BMI \geq 85%)	39%	41%

Abstract 17

Nighttime Sleep Duration and Externalizing Behaviors in Preschool Children

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Purpose: To test the hypothesis that 4 year-old children who sleep less than 9.5 hours at night (1 standard deviation below the mean) are more likely to exhibit externalizing behaviors than their peers who sleep 9.5 hours or more. Methods: This study examines the Early Childhood Longitudinal Study, Birth Cohort, a nationally representative sample of children born in 2001. Parents of 4 year-old children reported what time their child went to bed and woke on a typical weekday. Nighttime sleep duration was calculated from this information. Parents rated their children on a portion of the Preschool and Kindergarten Behavior Scale - 2nd Edition, which assesses overactivity, anger, aggression, impulsivity, temper tantrums and annoying behaviors on a scale from 1-5. Externalizing behaviors of less concern (responses of 1- 3) and more concern (4 or 5) were compared with sleep categories using chi-square. Results: The ~ 8900 children slept a mean of 10.43 +/- .97 hours per night. The average bedtime was 8: 40 pm. Of the total sample, 46% had at least one externalizing behavior (54.5% of the children in the shorter sleep group vs. 45% in the longer sleep group, $p <$.0001). In chi-square analysis, 4 year-old children sleeping less than 9.5 hours were significantly more likely than children with longer sleep duration to exhibit over-activity (33.1% vs. 25.1%, OR 1.47, 95% CI 1.28-1.70), anger (27.1% vs. 21.1%, OR 1.39, CI 1.20-1.62), aggression (13.7% vs. 7.6%, OR 1.93, CI 1.58-2.36), impulsivity (13.4% vs. 10.5%, OR 1.31, CI 1.08-1.60), temper tantrums

(22.7% vs. 16.1%, OR 1.52 CI 1.30-1.79) and annoying behaviors (8.7% vs. 6.4%, OR 1.39, CI 1.09-1.77) ($p < .0001$ for all analyses). Conclusion: As hypothesized, children with shorter sleep duration were more likely to exhibit externalizing behaviors. Further research is needed to examine causal relationships that cannot be determined in a cross-sectional analysis. These findings can alert parents and pediatricians to monitor nighttime sleep duration in preschool children.

Abstract 18

The Relationship between Tourette syndrome and Co-Occurring Emotional Disorders and Parental Aggravation

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Purpose: Tourette syndrome (TS) is a childhood onset, neurobehavioral disorder characterized by multiple persistent motor tics and at least one vocal tic. Parents of children with TS have reported lower self concepts, higher caregiver burden, more difficulties with home activities, and higher parenting stress. Greater rejecting parenting style, increased impact of the disorder on the family, and more problematic family relations have also been reported in families of children with TS and co-occurring mental, emotional, or behavioral (MEB) disorders in contrast to families of children with TS alone. The current study examined the relative contribution of MEBs to the relationship between TS and parental functioning in a nationally representative sample. Methods: Parent-reported data from the 2007 National Survey of Children's Health were analyzed, including whether the child had been diagnosed with TS or an MEB. Weighted analyses were restricted to US children 6-17 years of age and adjusted for child age, sex, race and ethnicity ($n = 64,034$, un-weighted). Results: Among children with TS, 79% had another MEB, most commonly ADHD and behavioral or conduct problems (externalizing disorders) and depression and anxiety problems (internalizing disorders). Compared to children without TS, parents of children with TS were more likely to report they were aggravated by their child (composite score: harder sharing ideas, coping less well, harder to care for child, child did things that bothered the parent, and the parent was angered by the child; OR = 5.4, 95% CI: 2.5-11.8) and the mean aggravation scale was significantly higher among children with TS. When both externalizing and internalizing disorders were controlled for in the model, the relationship between TS and aggravation no longer reached statistical significance. Both externalizing (OR = 5.2, 95% CI: 4.3-6.4) and internalizing disorders (OR = 2.5, 95% CI: 1.9-3.1) were significant and externalizing disorders exerted the largest relative effect. Conclusion: Results from the current study suggest that parents of children with TS may experience increased stress and difficulties parenting their children; however, these difficulties may be associated with co-occurring conditions. Addressing externalizing and internalizing disorders with evidence-based interventions may mitigate parental aggravation associated with TS and improve family functioning.

Poster Session I

Abstract 19

FruitZotic: Evaluating An Early Childhood Nutrition Education Program Using Child Development Theoretical Frameworks

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Purpose: FruitZotic (FZ) is an early childhood nutrition education program aimed at promoting the consumption of exotic fruits among children enrolled in rural Western Massachusetts Head Start sites. The objective of FZ is to incorporate a sensory theme nutrition curriculum and to help young children broaden their knowledge and awareness about locally available exotic fruits. Methods: During the five week-program, 80 children from 6

classrooms were presented with exotic fruits which they observed and tasted. Factors facilitating children's willingness to sample exotic fruit (mango, peach, pineapple, pomegranate) included reinforcement through fruit tasting, book reading, and art activities (Social Learning Theory) and exploration of fruits through the sensory observations (Constructivist Theory). Sensory exploration-themed, developmentally-appropriate learning activities increased the use of schemes, assimilation and accommodation (Cognitive Development, Constructivist, Behaviorist, and Social Learning Theories). Results: Consistent with Piaget's Pre-Operational Stage (Theory of Cognitive Development) a parents night component was concurrently implemented in order to further encourage willingness to try new fruits. Parents stated that they enjoyed the involvement of the children with food demonstrations and the children were excited to share their knowledge with their parents. Overall, more than 90% of the children improved their skills in identifying the fruits, and sufficiently described the sensory properties of the fruits. Teachers and parents rated the program positively. Conclusion: Sensory themed nutrition education guided by life-stage readiness and developmentally appropriate theoretical modes has the potential to increase young children's familiarity with exotic fruits. Exotic fruit nutrition education that targets young children should be tailored for the specific developmental stages, skills, and processes seen during this stage in life.

Abstract 20

Promoting Pediatric Mental Health Competency in Residency Training

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Purpose: We adapted an evidence-based parenting program to teach basic child behavior management strategies within a larger developmental-behavioral pediatrics curricular model that includes both core knowledge and skill building components. We evaluated our model's effect on residents' self-efficacy (comfort) in the identification, treatment and counseling of mental health issues. Methods: From August 2007 through January 2010, residents participating in the developmental-behavioral pediatrics (DBP) rotation completed a self-assessment questionnaire at two time points, baseline and at rotation end. Residents rated their comfort with the identification, treatment, and counseling of mental health problems using a 5-point scale. Results: Ninety-six residents participated in the DBP rotation and completed self-assessments. At baseline, categorical pediatric residents possessed higher self-efficacy towards identification (group mean 2.8 vs. 2.3 for non-categorical pediatrics residents, $p < 0.05$), treatment (group mean 2.6 vs. 2.2, $p < 0.05$) and counseling of mental health issues (group mean 2.7 vs. 2.1, $p < 0.005$). Residents who were parents also possessed higher baseline self-efficacy. At rotation end, all residents showed significant improvements in self-efficacy (baseline mean 2.6 vs. post-test mean 4.0 for identification, $p < 0.05$; baseline mean 2.4 vs. post-test mean 4.0 for treatment, $p < 0.05$; and baseline mean 2.4 vs. post-test mean 4.0 for counseling, $p < 0.05$). This remained true regardless of being a categorical pediatric resident, a parent or primary care-oriented. Conclusion: Our curricular model promotes residents' self-efficacy in dealing with mental health issues. Increasing residents' self-efficacy may influence the frequency of active discussion of these types of issues during well-child visits and lead to earlier diagnosis and needed treatment.

Abstract 21

Yoga in an Urban School for Children with Emotional-Behavioral Disabilities

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Purpose: We aimed to examine the feasibility and efficacy of delivering yoga sessions to a group of children with emotional/behavioral disorders at an urban school. Previous research has shown yoga and meditation to be beneficial for youth with emotional/behavioral conditions. We hypothesized that children who participate in a

series of yoga sessions will have: 1) lower stress levels as measured by salivary cortisol; and 2) diminished emotional and behavioral symptoms. Methods: Children were enrolled over two school years. The 3 ½ month intervention consisted of two formal yoga sessions a week in groups of 7-10 students in grades 4 and 5. Sessions were taught by a yoga teacher experienced in teaching yoga to children. Parents, children and teachers completed a systematic assessment pre- and post-intervention. At each assessment salivary cortisol was measured at arrival at school, before lunch, and after lunch. Results: 43 children were enrolled for the intervention; they adapted easily to the yoga classes. Children, parents and classroom teachers enjoyed and anticipated the yoga sessions, and noted the relaxation benefit. Preliminary data analysis shows improved attention in class ($p = 0.03$) and a reduction in depression ($p=0.03$), somatization ($p=0.04$), and internalizing symptoms (0.03) as reported by teachers. Salivary cortisol increased pre- to post-intervention ($p>.10$). Conclusion: These data suggest that yoga administered in small groups in an urban school setting may be effective in reducing symptoms in children with emotional-behavioral disabilities.

Abstract 23

The Role of Hope with Psychological Adjustment and Quality of Life in a Pediatric Cancer Population

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Purpose: Little is known about the relationship between hope, defined as goal-directed thinking, in which people appraise their capability to produce workable routes to goals (pathway thinking), along with their potential to initiate and sustain movement via a pathway (agency thinking), and co-morbidities of depression, anxiety and quality of life in pediatric patients with cancer. Methods: Newly diagnosed cancer patients (8-17 years of age) are enrolled onto a prospective observational study that examines the prevalence of depression and anxiety at diagnosis (within 4 weeks) and at 3 month intervals during the first year after diagnosis. Twenty patients (approximately 50 anticipated by September 2010) have completed Snyders Hope Scale as well as the Pediatric QOL Cancer Module, Childrens Depression Inventory, and the State-Trait Anxiety Inventory. Parents also completed Snyders Hope Scale and rated their childs Quality of Life. Results: Correlational analyses revealed that for children (ages 8-14), fewer symptoms of depression at diagnosis was associated with higher hope scores at diagnosis ($r(4) = -0.910, p<.05$) and 3 months after diagnosis ($r(3) = -0.927, p<.05$). Higher quality of life at diagnosis and at 3 months was also associated with higher child hope at 3 months ($r(3) = 0.967$ and 0.974 respectively, $p<.01$). Generally, older children endorsed higher hope ($r(5) = 0.905, p<.01$). For teens (ages 15-18) higher hope at diagnosis was related to lower state anxiety ($r(9) = -0.612, p<.05$) and higher quality of life ($r(9) = 0.646, p<.05$) during the same time period. Finally, higher parent hope at 6 months correlated with higher ratings of their childs quality of life at both 3 ($r(9) = 0.611, p<.05$) and 9 months ($r(2) = 0.954, p<.01$). Conclusion: Preliminary results suggest there is an association between hope and psychological comorbidity in these patients. Because hope is a construct which responds to intervention, it may provide an avenue for improved quality of life and psychological adjustment. Further assessment of the impact of hope on coping with pediatric cancer is warranted.

Abstract 24

Quality of Life Changes Associated With Long-Term Guanfacine Extended Release Treatment

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Purpose: To characterize quality of life (QoL) changes associated with guanfacine extended release (GXR; Intuniv™, Shire Development Inc., Wayne, PA) treatment. Methods: Subjects aged 6-17 years (n=240) with attention-deficit/hyperactivity disorder (ADHD) who participated in a double-blind randomized trial enrolled in an open-label extension study of GXR (2, 3, or 4 mg/d) ≤ 24 months. Dose escalation occurred within the first month. Spontaneously reported adverse events (AEs) data were collected at each visit. The Child Health Questionnaire-Parent Form (CHQ-PF50), a validated QoL measure yielding physical and psychosocial summary scores, was completed at baseline of the lead-in study and at 3, 6, 9, 12/13, 18, and 24 months. Results: Mean (SD) CHQ-PF50 psychosocial summary score improvement from baseline to endpoint was 12.3 (12.35) (P<0.001); significant improvements were also observed when analyzed by dose prior to tapering (P<0.001 for all dose groups) and age group (P<0.001 for both the 6-12 years and 13-17 years). CHQ-PF50 physical summary scores were not significantly affected from baseline to endpoint. The most common treatment-emergent AEs (TEAEs) were sedative in nature. Overall, 43.3% of subjects (n=104) reported ≥1 TEAE of somnolence, sedation or hypersomnia (SSH). Most were mild (48.7%) or moderate (45.4%) in severity and did not result in discontinuation. The incidence of these events was 30.8% at month 1 and <7% at each subsequent month. Conclusion: Long-term treatment with GXR was associated with significant improvements in the psychosocial summary score of the parent-rated CHQ-PF50 for both children and adolescents. This open-label study suggests improvement in QoL in the areas of behavior and family functioning with GXR treatment. Most treatment-emergent SSH events were mild to moderate in severity and did not result in discontinuation.

Abstract 26

Behavioral Profiles of Typically Developing (TD) Siblings of Children with Autistic Disorder (AD) in Mumbai, India

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Purpose: This study examined the behavioral profiles of TD siblings of children with AD who attended the Ummeed Child Development Center and the relationship of these profiles with maternal and family characteristics. Methods: Mothers of index AD children (N=49) completed the Child Behavior Checklist (CBCL) with respect to their TD children (24M, 25F; ages, 1.5-13yrs), the General Health Questionnaire-12 (GHQ-12) with respect to their own psychological well-being, and a questionnaire about family support and their TD child's understanding of autism. Results: The mean CBCL T-scores for internalizing (I), externalizing (E), and total (T) problem behavior subscales for the TD siblings were all within non-clinical ranges as per standard cut-offs. Using linear regression, significant relationships were found between T-scores and the number of years that the TD child has been exposed to the child with AD (I, $r=1.76$, $p<.01$; E, $r=1.29$, $p=.02$; T, $r=1.57$, $p=.02$), how well the TD child understands his/her AD sibling's special needs (I, $r= -2.45$, $p=.05$), and how often the mother talks to her TD child about the AD child's special needs (I, $r= -3.85$, $p<.01$). Surprisingly, higher CBCL scores were also correlated with maternal report of increased support from other members of her family (I, $r=3.99$, $p=.03$; E, $r=3.47$, $p=.03$; T, $r=4.13$, $p=.04$) and increased comfort in talking to members of her family about her concerns regarding her AD child (I, $r=1.00$, $p<.001$; E, $r=.56$, $p<.001$; T, $r=.94$, $p<.001$). No significant correlation was found between CBCL scores and maternal psychological distress as measured by the GHQ-12 or whether the child lived in a joint vs. nuclear family. Conclusion: These results suggest that living with a sibling with AD is associated with increased behavioral problems, but that discussion of the AD sibling's needs with the TD child may be somewhat protective. The correlation between increased maternal perception of familial support and increased behavioral problems in the TD child may reflect a greater real need for support by the mothers confronted with greater behavioral challenges in their children.

Abstract 27**Autism Rapid Diagnosis Clinic: a New Model for Efficient Early Diagnosis and Referral**

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Purpose: Demand for early autism diagnostic evaluations continues to grow as long waits for them delay access to crucial early services. We describe here a new diagnostic clinic model we pioneered for children younger than 3 years. Methods: We reviewed the number of children seen over a one year period in this new clinical model, gender, age, diagnosis, wait time to be seen, rates of no shows and of follow-ups. Results: The clinic is staffed by a neurodevelopmental pediatrician and a receptionist. Evaluations follow this protocol: a 90 minutes visit that includes neurodevelopmental and medical history; review of parental intake form and of Early Intervention evaluation; neurodevelopmental testing including ADOS and/or Mullen administration based on concerns and observations; physical examination. Diagnosis and recommendations are discussed then and families are provided with a letter to start setting services up. A full report follows. Referrals to further medical evaluations are made as needed. When a diagnosis of an ASD is made, the family is given extensive information about the disorder and access to an autism resource specialist. All are scheduled for a follow-up in 2-3 months. During the period January 2009 to December 2009, 59 children were evaluated; 41 (69.4%) were males and 18 (30.5%) were females. Only 3 (5%) did not keep their appointment. Age ranged between 9 and 35 months with an average of 28 months. Wait time between referral and the evaluation varied between 1 and 3 months with an average of 2 months. A diagnosis of ASD was provided in 37 (62.7%), language delay in 15 (25.4%), Global Developmental Delay in 6 (10%) and Behavioral Disorder, NOS in 1(1.6%). Forty-one (69.5%) came for at least 1 follow-up and of these 3 (5%) changed diagnosis. Conclusion: The clinical protocol described was successful in providing quick and efficient diagnostic evaluations for children younger than 3 years with concerns suggesting an autism spectrum disorder.

Abstract 28**Using 2D Digital Photographic Measurements to Aid in the Diagnosis of Fetal Alcohol Syndrome**

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Purpose: Evaluate 2D digital photographic measurements (PM) as an aid in diagnosis of Fetal Alcohol Syndrome (FAS). Methods: From 2006 to 2009, 121 patients were evaluated by PM and by clinical examination (CE) by a nurse practitioner and a pediatrician trained in FAS dysmorphology. Facial features were assessed in 3 views using digital photographs and analyzed using standardized facial software. Correlations, chi-square and positive predictive value (PPV) were computed. Results: Participants: 56% male; 9 +/- 5 years; 90% with non-biological parent; 56% adopted. Diagnoses: FAS 10% by both methods; Alcohol Related Neurodevelopmental Disorder (ARND) 75% by CE, 76% by PM; and no alcohol-related disorder 15% by CE, 14% by PM. Diagnoses by each method were correlated ($r=0.78$, $p<0.01$). PPV for diagnosis of FAS, ARND, and no disorder were 0.50, 0.92, 0.94 respectively. No sex-, age- or race-based differences found in final diagnosis or facial measurements. Conclusion: PM may be useful when a dysmorphologist is unavailable. The 2 methods were equivalent for diagnosis of ARND and no disorder. However, modest correlations for facial features raise questions about precision of PM related to CE. Poor agreement for diagnosis of full FAS raises concerns that small disagreement in facial measurements could result in different final diagnosis.

Correlation Table

Variables (n=121)	Correlation (r)
Final Diagnosis	0.78
Facial Rank	0.60

Palpebral Fissure Length	0.75
Palpebral Fissure Mean Score	0.55
Philtrum Score	0.41
Lip Score	0.56

Abstract 29

The Use of Complementary and Alternative Medicine in Children with Autistic Spectrum Disorders in the Stony Brook Service Area

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Purpose: Parents of children who have an autism spectrum disorder (ASD) often seek complementary and alternative medicine (CAM). This study was designed to review the patterns of CAM use by ASD patients in the Stony Brook service area. Methods: This is a cross-sectional study of the parents of children with ASD. The children were selected by reviewing the diagnostic codes 299.0, 299.01 or 299.80 used for medical billing over the last 3 years. 125 patients were identified and surveyed in this pilot study. The survey includes questions about the family/child's demographic information, and specific CAM modalities including the following four categories: dietary, supplements, vaccinations, and others. Results: 33 questionnaires were returned and included in the data analysis. The most frequently used CAM is dietary supplementation, 54.5% of the subjects have tried some form of supplement. The second most popular treatment is sensory integration, 33.3% of the patients have used this therapy. The third most used CAM is diet modification, 30.3% of the patients have tried this modality. 18.2% of the parents choose to withhold some vaccinations. For patients who are on supplements, 39.4% use vitamins and minerals, and 30.3% use melatonin. Casein free and gluten free diets are the most popular in our subject group, with 27.3% on a casein free diet, and 24.2% have tried a gluten free diet. 50% of the parents who withhold vaccinations have no intention to give their children the rest of the recommended vaccines. Conclusion: A high percentage of parents have adopted some form of CAM to help manage their child's ASD. Supplementation is the most commonly used CAM in our patient population. However, the majority of the patients who are on vitamins are taking them for health maintenance reasons. Diet modification is also popular among our surveyed group. This can cause nutritional deficiency since children with ASD already have very restricted diets due to their sensory problems. Withholding immunizations is common in our patient population. This can potentially lead to public health issues and unnecessary medical workup.

Abstract 30

Do Questions about Parent Concerns Provide Adequate Surveillance?

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Purpose: The American Academy of Pediatrics recommends surveillance of children's behavior and development by asking parents "Do you have concerns about your child's behavior? Development? Learning?", but no published data confirm the usefulness of these questions. As part of a larger study, parents were asked these 3 questions. Data were analyzed to determine how well parents' concerns reflected problems identified by validated screening measures. Methods: 447 parents of children ages 2 months to 5.5 years were recruited from urban and suburban primary care pediatric waiting rooms. In addition to specific questions about developmental milestones, behaviors, and concerns, parents completed the Ages and Stages Questionnaire-Social-Emotional (ASQ-SE), a behavioral screener, and the Ages and Stages Questionnaire (ASQ-3), a developmental screener. We assessed the psychometrics of each question individually and all three as a group. Results: 99 parents (22%) reported having a

concern about their child on one or more questions. Using clinical scores on the ASQ and/or the ASQ-SE as a criterion, the sensitivity of this group of 3 questions was 48%; specificity was 83% and positive predictive validity was 33%. Individually, each question was more sensitive in relation to behavioral risk than to developmental risk. In particular, parents who reported developmental problems in the absence of behavioral problems were unlikely to report concerns on any of the 3 questions. Family income and parent education were not related to concerns. Conclusion: Fewer than half of the parents of children who scored in the clinical range on the ASQ or ASQ-SE reported having one or more concerns. Parents' concerns appear to be particularly inconsistent with their own reports of developmental problems that occur in the absence of behavioral symptoms. Thus, these questions are not sufficient for effective surveillance.

Sensitivity of parent concerns to ASQ and ASQ-SE scores:

	Clinical Range ASQ-SE Only	Clinical Range ASQ3 Only	Clinical Range Both
Concerns about Development	34%	13%	36%
Concerns about Behavior	59%	4%	20%
Concerns about Learning	21%	9%	24%
Any Concerns	60%	17%	36%

Abstract 33

Observed Maternal Feeding Style and Toddler Weight Status

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Purpose: To determine the independent association of observed maternal feeding style with child weight status. **Methods:** Mother-child pairs participating in the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development were videotaped during a laboratory snack session when the child was aged 15, 24, and 36 months. Intrusiveness was coded as yes versus no. Number of physical encouragements, verbal encouragements, and verbal food offers were counted. Child weight and height were measured and weight-for-length or body mass index z-score calculated. Generalized estimating equations were used to examine the relationship of intrusiveness (yes v. no) , as well as number of prompts and prompt type, with child weight status z-score, controlling for child sex, race, maternal education, maternal depressive symptoms, and maternal weight status. **Results:** 1253 children, 85% white and 50% male, were included. In the adjusted models, the mother being intrusive during feeding was associated with a slightly higher weight-for-length or BMI z-score across toddlerhood (0.08 standard deviation units (SDU), SE 0.03, p = .002). Mothers whose prompts to eat were always verbal food offers, as opposed to other types of prompts, had children with significantly lower weight-for-length or BMI z-scores (0.17 SDU, SE 0.07, p = .02), while mothers whose prompts to eat were always verbal encouragements had children with significantly higher weight-for-length or BMI z-scores (0.16 SDU, SE 0.07, p = .03). **Conclusion:** The style with which a mother was observed to feed her toddler was associated with the toddlers weight status, such that a more intrusive style was associated with a higher weight status, independent of confounders. The results are consistent with prior studies demonstrating an association between less sensitive parenting and a higher risk of child obesity. The results therefore suggest that pediatricians should encourage mothers to use a more sensitive and less intrusive feeding style as one potential strategy to prevent the development of obesity.

Abstract 34

Clinical Genetic Clues to the Origins and Outcomes of Autism Spectrum Disorders

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Purpose: Autism Spectrum Disorders (ASDs) are the most common childhood developmental disorder. The ASD population is heterogeneous and despite high prevalence and clear evidence that early interventions can optimize development, ASDs are often not recognized until age 3 or older. In up to 40% of cases, ASD behaviours are recognized as a component of specific medical, genetic or chromosomal disorders. In most others, affected children can have seizures, co-existing psychiatric disorders, intellectual disability, and major or minor physical anomalies. These co-morbidities often occur as clusters of symptoms, suggesting syndromic relationships to each other and to ASDs. We aim to identify reliable biomarkers of ASD susceptibility, etiology and co-morbidity that may lead to earlier detection and improved management. Methods: We applied a series of standardized measurement tools to select specific genetic, medical and teratogenic conditions known to co-exist with ASDs amongst a randomly selected cohort of >300 individuals with an ADOS and ADI-R confirmed ASD. All individuals received standardized clinical genetics consultation by a certified medical geneticist including review of family, medical and developmental history and dysmorphology exam. Clinical investigations included Fragile X gene testing, karyotype, subtelomeric and targeted FISH testing for common rearrangements of autism-associated loci at 2q37, 7q11, 15q11, 22q11 and 22q13. Data were analyzed to identify ASD clusters/subgroups that may differ in etiology, associated co-morbidities, outcome and genetic measures. Results: Comprehensive clinical genetic assessments revealed heightened frequency of co-existing intellectual disability (ID), as well as craniofacial, systemic, growth and neuroclinical anomalies (seizures, vision) within each different ASD-associated genetic, chromosomal, genomic syndromic and non-syndromic disorders. Conclusion: By identifying several cases sharing the same phenotypic pattern of symptoms, co-morbidities and/or clinical genetic/syndromic contributors to ASDs, we can begin to generate guidelines to facilitate optimal anticipatory management and functional outcomes for individuals and families living with ASDs. Our findings aim to set the standard for Clinical Genetic and Child Health Services critical to recognizing and managing brain and body features/co-morbidities of autism to improve individualized therapies and management.

Abstract 36

Examining the Relationship between Varying Symptom Presentation in Children with Autism Spectrum Disorder and the Adjustment of their Typically Developing Siblings

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Purpose: Numerous studies have focused on potential challenges faced by typically developing (TD) siblings of children with physical or developmental disability, including Autism Spectrum Disorder (ASD) (Bagenholm & Gillberg, 1991; Knott, Lewis & Williams, 1995; Opperman & Alant, 2003; Hastings, 2007; Barr, McLeod & Daniel, 2008). This study aims to examine how the varying symptom presentation in children with ASD relates to the

adjustment of their TD siblings. Methods: A convenience sample of 99 families, with a child aged 4 to 18 affected with ASD, as well as a TD child aged 6 to 23, have participated. To verify ASD diagnosis in the proband, the Autism Diagnostic Observation Schedule (ADOS) and Autism Diagnostic Interview-Revised (ADI-R) were performed. In addition, cognitive and behavioral measures were administered. Overall severity of symptoms was calculated using the Calibrated Severity Score (CSS) (Gotham, Pickles & Lord, 2009). To confirm neurotypical development in the unaffected child, parents completed the Social Responsiveness Scale (SRS) and provided medical and educational information. In addition, parents completed measures to characterize emotional and behavioral development of their TD child, including the Child Behavior Checklist (CBCL) and the Vineland Adaptive Behavioral Scales-II (VABS-II). Results: A regression analysis tested for associations between proband behavioral phenotype and TD sibling emotional and behavioral development. When compared to the Restricted and Repetitive Behaviors and Interests (RRBI) domain on the ADI-R, ten of the fifteen subdomains in TD siblings tested on the VABS-II and CBCL were found to be statistically significant ($p < .05$). All other domains on the ADOS and ADI-R, including those assessing social interaction and communication deficits, as well as CSS, were not associated with difficulties in TD siblings. Conclusion: Children with ASD who have an increased presence of RRBI have siblings with a higher prevalence of social, emotional and behavioral difficulties, when measured using subscales on the CBCL and VABS-II. Social interaction and communication domains on the ADI-R and ADOS, as well as CSS were not significantly correlated with difficulties in the TD sibling. Future studies will need to clarify the relationship between RRBI and their effects on TD sibling development.

Abstract 38

Correlates between Mental Health and Language Development in Children and Adolescents with Hearing Impairments

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Purpose: The aim of this study is to elucidate factors of language development and communication related to the high rate of Mental Health disorders seen in those with impaired hearing, including social factors and audiological measures. Methods: A representative sample of 95 pupils (47 females, 48 males; mean age 11y 1mo, range 6y 5mo to 16y, SD 2y 7mo) with hearing impairments of at least 40 dB and normal non-verbal intelligence (IQ 97.5, SD 19.5), was assessed audiological and with a structured clinical interview (Kinder-DIPS) giving both current and lifetime diagnoses, and the Strengths and Difficulties Questionnaire. Detailed social information was gathered from parents and teachers. Language skills and conversational proficiency in spoken/heard and signed language as well as reading comprehension were assessed with standardized instruments. Results: Prevalence of Mental Health disorders was about twice as high as in the general population. Outcomes for spoken and written language were strongly related to the degree of hearing loss. Mental Health disorders were 4.12 times (1,2-14,1) more likely to be found in children who had problems to make themselves understood in the family but were not significantly related to the degree of hearing loss, academic skills (reading comprehension) and spoken or signed language proficiencies. Children who were not able to make themselves understood in their family were more frequently victims of adverse experiences at school. Peer relationship problems of adolescents did not correlate with the degree of hearing impairment or discrete linguistic skills but with the level of language used in conversation with peers at school whether in signed or spoken language. Conclusion: The priority of family communication in early years is emphasized. In adolescents decisions of school placement have to consider the level of language competence in the mode used by peers.

Abstract 40

Influences of Family Stress on Externalizing Behaviors of Urban Children

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Purpose: Externalizing behavior problems in urban children are associated with school drop-out and delinquency. A randomized controlled trial of an innovative home visiting program, The MOM Program, offers promise in reducing aggression in urban children. In a prior analysis, at age 60 months, children in the intervention group showed significantly less aggression than children in the control group. This report presents results from the 8-year follow-up of 180 children (60% of the original cohort). Methods: To evaluate family contributors to child externalizing behaviors, we used the Family Inventory of Resources and Stressors (FIRST) and the Beck Depression Inventory-II (BDI-II). Results: There were no group differences in child behavior problems, family stress, and maternal depression. For the combined sample, child externalizing behaviors were significantly related to family stress and maternal depression, (see table). Stepwise multiple regression of predictors of child externalizing behaviors demonstrated that the beta weight for family stress exceeded that for maternal depression. In a separate stepwise multiple regression, elements of family stress most strongly predictive of child externalizing behaviors included maternal disorganization and forgetfulness, family arguments and temper outbursts, and family mental illness. Conclusion: This study offers support for the development of interventions to enhance maternal executive functioning and family conflict management.

Means, Standard Deviations, and Intercorrelations for Measures

Variable	M	SD	1	2
CBCL Externalizing	53.53	10.56	.498*	.432*
Predictor Variables				
1. Family Stress	42.47	9.81	-	.574*
2. Maternal Depression	6.38	7.32	.574*	-

Abstract 42

Detection of Neuromotor Abnormalities in Former Preterm Infants by Parent Completed Screening Tools

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Purpose: Neuromotor impairment is a significant area of disability in former preterm infants. Given financial and time constraints, physicians often rely on their physical/neurologic examination and parent-completed developmental screening questionnaires (PQ) to detect motor abnormalities despite the lack of supporting evidence for use of PQ for this purpose. This study evaluated the ability of parent-completed questionnaires to detect neuromotor impairment in the former preterm infant, in comparison to a directly administered motor screen. Methods: Infants <37 weeks gestation were consecutively enrolled. Parents completed the Parents Evaluation of Developmental Status (PEDS) and the Ages and Stages Questionnaire, 3rd edition (ASQ-3) for child's age corrected for prematurity at their routine developmental follow-up visit. The Alberta Infant Motor Scale (AIMS) was administered as the gold standard for motor function and scored for corrected gestational age. Total AIMS scores below 25% for corrected gestational age were considered concerning. The PEDS was considered a "concern," if the parent marked "yes" or "a little" to concerns on the gross motor question. The ASQ was considered a "concern" on the gross motor portion if the score interpretation was borderline or below the cut-off. Results: Participants ranged 2 to 4 months, corrected for gestational age. Of the 25 participants, 76% were male, 52% were White and 44% African-American. Gestational age ranged 26 to 35 weeks, birth weight from 750 to 2465 grams. 36% of the patients had AIMS scores below 25%. Sensitivity of the PEDS to detect gross motor

abnormalities was 22%, specificity 94%. Sensitivity of ASQ-3 to detect gross motor abnormalities was 33%, specificity 88%. Conclusion: Parent questionnaires around the 3 month corrected gestational age had low sensitivity in detecting neuromotor abnormalities, when compared to a physician administered neuromotor gold standard tool. Physicians should consider performing a standardized neuromotor assessment and not rely solely on parent-completed questionnaires to detect early neuromotor abnormalities in the high-risk infant.

Abstract 43

Acupuncture for Adolescents with Chronic Pain: Pain and Health-Related Quality of Life

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Purpose: Adolescents with chronic pain have been shown to have significant impairments in quality of life. While acupuncture research has primarily been conducted in adult and pediatric populations with a variety of diseases, including gastrointestinal and neuropathic disorders, to date only a few investigations have examined the effects of acupuncture on HRQOL in adolescents with chronic pain. Methods: A case series on four adolescents (mean age 15.25, 3 females) with chronic pain is presented as part of an ongoing 8-week pre- and post- test acupuncture intervention in an interdisciplinary outpatient pediatric pain management clinic. Participants completed measures of pain intensity (i.e., Faces Pain Scale-Revised, and the Color Analogue Scale (CAS)), and health related quality of life (PedsQL) at weekly sessions. Results: All participants self-reported decreased pain intensity from pre- to post-acupuncture per session on the Faces Pain Scale-revised ($t = 3.62$, $p < 0.001$) and the CAS Scale ($t = 4.81$, $p < 0.0001$). Three of the four participants showed overall improvement in health-related quality of life, as demonstrated by the total PedsQL summary score ($M = 45.66$ (T1), $M = 73.91$ (T8)). Three of the four participants showed overall improvement in the physical PedsQL subscale ($M = 30.21$ (T1), $M = 61.46$ (T8)), emotional subscale ($M = 51.67$ (T1), $M = 75.00$ (T8)), and social subscale ($M = 65.00$ (T1), $M = 91.67$ (T8)). All participants reported an improvement on the PedsQL academic subscale ($M = 48.75$ (T1), $M = 70.00$ (T8)). Conclusion: Adolescents who received 8 weekly acupuncture treatments demonstrated decreases in pain intensity and increased functional health-related quality of life. Future work should evaluate the long-term pain relief and quality sleep associated with acupuncture in adolescents with chronic pain. Acupuncture may be an efficacious complementary treatment in modulating pain and increasing functioning for adolescents and therefore, an essential part of a multidisciplinary treatment approach for adolescents with chronic pain.

Abstract 44

How Parents want to Learn about Parenting

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Purpose: Less than 20% of parents of children with behavior problems obtain treatment. The goal of the present study was to assess how parents in a rural community would like to receive information regarding parenting and to identify factors that predict whether or not parents will attend parenting classes. Methods: 69 parents of children ages 2-8 were recruited in the waiting room of a Midwestern, rural, primary care pediatric practice. Parents completed instruments assessing where they obtain and would like to receive advice on parenting, their child's behavior, barriers to treatment, perceived stigma regarding treatment, and beliefs regarding the effectiveness of various interventions. Results: Repeated measures ANOVA found that parents believe that parenting advice obtained during individual appointments at their child's pediatric office, whether during a well child or separate

visit, would be significantly more helpful than group classes, DVD, internet, or handouts ($p < .05$). Although parents most often received parenting advice from their family and friends, parents reported wanting advice from their child's pediatrician more often than any other source, including friends, family, mental health professionals, child care workers, and clergy. Results of a linear regression demonstrated that parents are most willing to attend parenting classes when they believe the classes will be effective ($p < .01$), and when they believe that their child has a behavioral problem ($p < .05$), after controlling for barriers. A t-test demonstrated that parents believe that if they attend parenting classes, their child will receive more stigma than the parent ($p < .01$). Conclusion: Parents want to receive parenting advice from their child's pediatrician more than any other source and believe that advice obtained from their child's pediatrician will be most effective in treating child behavior problems. The finding that parents are more likely to attend treatment that they believe will be helpful underscores the importance of emphasizing the effectiveness of treatments when describing them to parents. Physicians should attend to parent concerns regarding stigma toward their child as potential barrier to attending treatment.

Abstract 45

WITHDRAWN

Abstract 47

Family Impact of Toddlers' Disruptive Behavior

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Purpose: Child behavioral problems can have a negative impact on family functioning. The extent to which parents attribute family difficulties to their children's disruptive behavior is unknown. We assessed the impact of toddlers' behavior problems on families using a modified Impact on Family (IoF) scale. Methods: We administered the modified IoF scale to 263 parents of 2 to 4 year old children whose parents reported disruptive behavior problems. Parents were asked to rate their agreement with 30 statements describing family stresses such as financial burden, emotional strain, and parental conflict. They were then asked to rate the extent to which each issue resulted from their child's behavior. Two IoF scores were calculated; one for family stress, and a second for negative attributions to the child's behavior. IoF scores were compared to concurrent measures of parenting (Parenting Scale; Parenting Practices Inventory; Parent Problem Checklist), child behavior (Infant-Toddler Social and Emotional Assessment), and social support (Family Support Scale). Results: High scores on IoF correlated with over-reactive parenting ($r = .32$, $p < .01$), harsh parenting ($r = .37$, $p < .01$), parental depressive symptoms ($r = .36$, $p < .01$), parental conflict ($r = .3$, $p < .01$), child dysregulation ($r = .35$; $p < .01$) and weak social support ($r = .3$, $p < .01$). Most families attributed few stresses to their child's behavior problems, but those families who did (upper quartile; $n = 78$) showed significant differences from those who did not with regard to harsh parenting ($p < .01$), child dysregulation ($p < .01$), parental depressive symptoms ($p < .01$), and parental conflict ($p < .01$). Family stresses most often attributed to child behavior problems included thinking about not having more children, parental fatigue, conflict with siblings, and interference from extended family. Conclusion: Although most parents of children with disruptive behavior attribute few or no family problems to their children's behavior, those that do experience significant dysfunction. This study supports the validity of this modified version of the IoF to measure the perceived impact of behavioral problems on family functioning.

Abstract 48

Physicians' Perception of Mental Health Services Effectiveness, acceptability, and Availability

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Purpose: Psychosocial problems affect 15-20% of children with less than 5% being referred to mental health professionals by their primary care pediatricians (PCPs). We extended previous research by examining PCP perception of mental health services effectiveness, acceptability, and availability as well as how PCPs manage psychosocial problems within their practices. Methods: Participants were 50 PCPs in and around a midsize Midwestern city. Physicians completed a brief objective questionnaire with questions were rated on a 7-point scale. Results: Similar to past research, PCPs endorsed that addressing mental health problems is important for their patients' health, yet reported a lack of confidence in dealing with these issues. Paired sample t-tests revealed that PCPs thought there were significantly more mental health services available for children with private insurance ($M=4.33$, $SD=1.76$) than with Medicaid ($M=3.45$, $SD=1.47$, $p<.01$). There was considerable variability in PCP perception of service availability, despite all PCPs practicing in the same area. Repeated measures ANOVA found that PCPs reported they are more likely to refer children with psychosocial problems to a mental health professional than they are to prescribe medication ($p<.01$) and that they would be likely to refer at higher rates if services were more available ($p<.01$). PCPs reported that they prescribe medications more than counseling parents themselves ($p<.01$) or watchful waiting ($p<.01$). PCPs believe that children's behavior problems are more likely to improve with mental health services than with medication ($p<.01$); however, medication was seen as the most available treatment ($p<.01$). PCPs report they believe parents would be more satisfied with a mental health referral than being prescribed medication ($p<.05$) but when PCPs believe parents will be accepting of medication, they are more likely to prescribe ($p<.05$). Conclusion: The present findings demonstrate variability among PCPs in their perception of mental health services availability. Perception of parent acceptability and satisfaction is related to management choices, in spite of PCP perception of effectiveness.

Abstract 49

Body Composition as a Nutritional Marker in Neurodevelopmental Outcomes of Preterm Infants <1250 gm at Birth

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Purpose: Preterm infants are at risk for growth failure and adverse neurodevelopmental outcomes (NDO). It is unclear whether or not body composition (% Fat) is associated with NDO. Methods: Infants were evaluated in a neonatal high risk follow-up clinic at 6 mos age, with growth measurements (weight (WT), length (HT) & head circumference (HC) percentiles) and body composition assessment (%Fat) using air plethysmography (PeaPod). Neurodevelopmental assessment measures included the Capute Scales (CAT/CLAMS) for cognitive (CAT) and language (CLAMS) skills and modified Peabody Gross Motor Scale for gross motor skills, with calculation of developmental quotients adjusted for prematurity (adjusted age, AA). Results: 95 infants (52 females; 43 males) were evaluated at mean chronological age 6.3 months (56.7 weeks post-menstrual age, PMA) with mean WT %ile: 33.3; HT %ile: 31.3; HC %ile: 40.1; and %Fat 18.7 (range 1-32.9%). Mean CAT AA DQ was 109.4; CLAMS AA DQ was 125.9; and Gross Motor AA DQ was 106.2. % Fat and AA DQs were not associated with gender or feeding type. DQs did not differ by race, but African American infants had lower mean % Fat vs. Caucasian infants (17.6 vs 21.2%; $p=0.02$). %Fat was associated with: WT% ($r=0.43$, $p=0.0001$); HT% ($r=0.24$, $p=0.02$); and HC% ($r=0.21$, $p=0.05$). When controlling for PMA, % Fat was associated with CAT AA DQ ($p=0.002$) and CLAMS AA DQ ($p=0.02$), but not with Gross Motor AA DQ ($p=0.22$). CAT/CLAMS DQs increased as % Fat increased. Conclusion: %Fat correlated with cognitive and language skills but not gross motor skills. This indicates that body composition measurement (% Fat) is an important measure for nutritional status and related to cognitive and language NDO in preterm infants. It may be less important for motor development.

Abstract 50

Examining Fluent Reading Networks in Adults: Implications for Developmental Dyslexia?

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Purpose: Reading fluency entails rapid and accurate written language processing with comprehension and requires the coordination of various reading subskills. Slow, dysfluent reading is a key feature of developmental dyslexia (DD) but to date no study has examined the neural correlates of reading fluency in children. Here, we piloted a child-appropriate task in adults to examine speed-related changes in the reading fluency network. We hypothesized greater speed would increase cognitive demands and increase network activation. Methods: 13 right-handed adults (12 female; mean age 24.05 yrs) completed two fMRI reading tasks at individually determined slow, comfortable and fast speeds. In the fluent sentence reading task, words constituting a sentence accrued sequentially on a screen and subjects were asked to select an image that best illustrated the meaning of the sentence from distracters. In the letter reading task, matched groups of identical letters and a single target were similarly presented, and subjects were asked to identify the target. Letter stimuli were matched to the sentences in overall number and letter grouping. Null periods were presented between trials. Results: Behavioral performance for both tasks was over 95%. The three fluent sentence reading contrasts (each speed > null) were associated with bilateral occipito-fusiform, left middle temporal and left inferior frontal gyral activation. As speed increased, so did activity in the occipital cortex and the visual word-form area (fusiform gyrus; left > right). Letter reading tasks (tasks > null) engaged lateral occipital cortex bilaterally, along with fronto-parietal, subcortical and frontal regions at all three speeds. In this task greater presentation speed elevated superior parietal and supramarginal activation. Thus increasing reading speed in fluent reading with comprehension increases activation in the visual word-form area. Conclusion: Increased reading speed during fluent reading leads to activation increases in brain areas engaged in visual word form processing but not in higher-order components of the reading network. We are now evaluating fluent network-related changes in children with and without a diagnosis of DD using this task.

Abstract 51

Who Doesn't Know? Mothers Who Have Not Heard About the Dangers of Shaking a Baby

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Purpose: Controversy exists regarding the definition of 'Shaken Baby Syndrome' and its true incidence. Abusive head trauma (AHT) is one of the most common causes of infant morbidity and mortality. The 2009 AAP policy statement supports pediatricians in their role as educators to prevent 'Shaken Baby Syndrome.' Our objective was to determine demographic and psychosocial characteristics associated with a lack of knowledge of the safe handling of babies in a population based sample of recent mothers in Rhode Island. Methods: Using the CDC's Pregnancy Risk Assessment Monitoring System 7,934 RI women giving birth between 2004-7 were surveyed (73.8% weighted response rate). Lack of Knowledge of Shaken Baby Syndrome (LKSBS) was assessed by asking mothers if they had heard or read about the dangers of shaking a baby. Results: LKSBS was reported by 6% of mothers. Significant differences were found by to maternal race/ethnicity (NHWhite 2%, NHBlack 17%, Hispanic 13%, Asian/PI 16%, other 5%, $p < .0001$). A logistic regression found that LKSBS was independently associated with mothers who were of minority status including NHBlack (AOR=3.4; CI=2.0-5.7, $p < .0001$), Hispanic (AOR=1.9; CI=1.1-3.2, $p < .05$), and Asian/PI (AOR=3.3; CI=1.8-6.3, $p < .001$). Other factors predictive of LKSBS included mothers who

were: immigrants (AOR=3.0; CI=1.2-2.4, $p<.0001$), primiparous (AOR=1.7; CI=1.2-2.4, $p<.01$), acknowledged symptoms of post-partum depression (AOR=1.7; CI=1.1-2.5, $p<.01$), and reported < 5 of 5 social supports (AOR=1.6; CI=1.1-2.3, $p<.01$). Factors associated with LKSBS in bivariate analysis that were no longer predictive of LKSBS in this model were: infant inconsolability, maternal age, education, insurance status, marital status, other race and recent exposure to intimate partner violence. Conclusion: Despite campaigns to raise awareness regarding the dangers of shaking a baby, 1 in 17 mothers of young infants in RI lacked this knowledge. This study suggests that new educational efforts should be designed to reach out to minority, immigrant, and first time mothers to address this public health concern. Expansion of this analysis to a more nationally representative sample is warranted.

Abstract 52

Neural correlates of Phonological Processing are Disrupted in Pre-readers at Risk for Developmental Dyslexia

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Purpose: Developmental dyslexia (DD) is one of the most prominent specific learning disabilities, affecting 5-17% of all children. Longitudinal studies in children with a family history of DD identified phonological processing as one of the key predictors of DD. Functional neuroimaging (fMRI) studies have revealed that children and adults with DD exhibit reduced or absent activation in perisylvian, occipito-temporal and parieto-temporal cortical regions that are activated in typical readers during phonological tasks. However, analysis of whole-brain functional networks in pre-reading children at risk for DD remains unexplored. This study seeks to investigate possible neural and behavioral premarkers of DD in pre-reading children with (FHD+) and without (FHD-) a family history of DD. **Methods:** 52 right-handed children completed standardized psychometric tests. Whole brain fMRI was performed on 32 participants (16 FHD+/16 FHD-; 5.5y) during phonological processing. Participants were instructed to listen to two subsequently presented common object words spoken in a female or male voice. During the experimental task, participants performed a first-sound-matching task. In the control task, participants were asked to perform a voice-matching task. Random-effects analyses for experimental versus control tasks were performed. **Results:** FHD- children performed significantly better than FHD+ children on behavioral assessments of expressive language, phonological processing and rapid naming, but not nonverbal IQ. Preliminary imaging results revealed reduced activation in a left-hemispheric network including the temporo-occipital junction, similar to that seen in children and adults with a diagnosis of DD. **Conclusion:** Pre-reading children with compared to those without a family-history of DD already show a disruption in the neural response to phonological processing tasks that is similar to that seen in children and adults with a diagnosis of DD. Future longitudinal studies will have to determine whether the identified differences may serve as neural pre-markers for the early identification of children at risk for DD.

Abstract 53

Maternal Worry about Language and Behavior from Early Childhood to Elementary School

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Purpose: To examine whether worry type (language/behavior), problem severity, and child sex impacts parent worry about child development from toddlerhood to elementary school **Methods:** Participants comprised a randomly selected birth sample. This report included 4 waves of mother-report data from 12 months to second grade ($N=1,036$). Behavior problems were measured using the *Infant-Toddler Social and Emotional Assessment in Years 1/2* and the *Child Behavior Checklist/6-18* in elementary school. We measured language problems with the *MacArthur-Bates Communicative Development Inventories*. Parents answered 2 Likert scale questions: *How worried are you about your child's behavior/language development?* **Results:** Maternal worry diminished over time; worry about language showed a steeper decline than worry about behavior (language: $F(3, 828)=17.01$, $p<.001$, partial $\eta^2=.06$, behavior: $F(3, 824)=3.38$, $p<.05$, partial $\eta^2=.01$). At each wave, mothers worried more about behavior than language and boys than girls. In elementary school, boys mothers reported more behavior/language

problems than girls mothers (X^2 range=3.79 to 13.65, $ps<.05$), but there were no sex differences in Year 1 or 2. Mothers of children with behavior/language problems showed higher rates of worry, but most were not worried. Behavior was a better predictor of worry as children aged. Conclusion: Screening based on worry may underestimate problems particularly in young children and girls

Maternal Worry by Problem Type and Child Sex

	n	M (SD)	Worry (%)	Chi Sq Type	Worry Girls %	Worry Boys %	Chi Sq Sex
Year 1 Behavior	1023	24.5 (7.2) mo	150 (14.9)	113.19***	67 (12.5)	83 (17.4)	4.38*
Year 1 Language			131 (13.0)		48 (9.0)	83 (17.5)	15.10***
Year 2 Behavior	1016	36.6 (7.3) mo	153 (15.3)	117.91***	66 (12.6)	87 (18.2)	5.52*
Year 2 Language			103 (10.2)		38 (7.2)	65 (13.5)	10.16**
K Behavior	980	6.4 (.4) yrs	111 (11.5)	46.34***	40 (7.9)	71 (15.4)	12.55***
K Language			83 (8.6)		32 (6.3)	51 (11.1)	6.27*
2nd Grade Behavior	961	8.0 (.5) yrs	116 (12.2)	29.54***	40 (8.0)	76 (16.9)	16.62***
2nd Grade Language			56 (5.9)		21 (4.2)	35 (7.7)	4.83*

Abstract 54

Old Wives' Tales: Do General Pediatricians Subscribe To Common Myths about Child Development and Behavior?

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Purpose: Parents subscribe to many myths regarding children's development and behavior (D-B). Although pediatricians are expected to provide parents with accurate information, no study has specifically examined pediatrician knowledge regarding common D-B parenting misconceptions. The objective of this study was to assess to what extent general pediatricians subscribe to common D-B parenting myths and old wives' tales, and to identify which sociodemographic variables are associated with a greater belief in these myths. Methods: The Pediatric Health Beliefs Questionnaire was developed to sample pediatricians' knowledge about common parenting myths. The PHBQ contains 34 myths (9 of which focused on development and/or behavior) and 14 true statements. Pediatricians were asked to what extent each of the 48 health belief statements was true, likely true, unsure, likely false, or false. The PHBQ also included items regarding the physicians' personal and professional demographics. It was mailed to a random sample of 5,000 U.S. born, board-certified primary care pediatricians. In addition to descriptive statistics, demographic variables were analyzed using chi square ($p<.05$); where significant, pair-wise comparisons were done with $p<.01$ and Bonferroni correction for multiple comparisons. Results: Responses were received from 1002 pediatricians. Only 34% correctly identified all 9 D-B myths as being false or likely false. The majority of pediatricians wrongly endorsed at least 1 myth as being true, and 33% incorrectly

identified 2 or more myths as correct. For example, 12% of pediatricians noted that babies who listen to Mozart or other classical music will be smarter, and another 13% were unsure. Four percent believed that sugar causes hyperactivity in school-age children, and 11% were unsure. Five percent believed reading in the dark causes later problems, and 7% were uncertain. Pediatricians who never raised children endorsed more myths, as did female physicians, those working in clinic settings, and those who were in practice for a shorter period of time.

Conclusion: Many myths about children's development and behavior are widely believed by pediatricians. Greater educational efforts must be made to ensure that pediatricians themselves provide accurate parenting information to parents.

Abstract 56

A Primary Care-based Spanish Parenting Intervention to Address Behavioral Problems in Children: A Study of Feasibility and Barriers

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Purpose: Latino children living in the United States are at increased risk for behavioral problems than their non-Latino peers (1), yet fewer than 25% receive the mental health care they need (2). Behavior disorders respond well to early childhood intervention (3), and primary care clinics are emerging as innovative and effective settings for detecting and providing interventions for child behavior problems even before children begin school (4). The current study implemented a behavioral parenting intervention in a pediatric primary care clinic specializing in treating Latino, mainly Puerto Rican, bilingual patients. The outcome of this study focused on assessing feasibility of implementation, including evaluating desirability, acceptance and effectiveness of the intervention. Methods: A validated behavioral parenting intervention was pilot tested in a Hispanic pediatric primary care clinic. Latino parents with children aged 2-8 years were screened. Measures included weekly acceptance and helpfulness ratings, pre- and post-intervention responses on the Spanish versions of the Child Behavior Checklist, the Parenting Sense of Competency, and the Parenting Practices Scale, and the Center for Epidemiologic Studies scale for Depression, and the Therapy Attitude Inventory. Results: Forty-four Latino parents of children were approached and screened for child behavior concerns. Thirty-five parents endorsed concern, 23 parents were interested in the intervention and 9 eventually participated. A total of 6 mothers completed the parenting intervention, which was rated as useful, desirable, and associated with an increase in parenting satisfaction and trends toward a decrease in maternal depression and child internalizing symptoms. Conclusion: Spanish-language primary care-based parenting groups were shown to be feasible, however limited child care services and difficulty contacting parents for follow-up negatively impacted the number of parents enrolled in the intervention. Future research should focus on how to overcome systemic barriers and maximize the effectiveness of parenting interventions in Latino populations.

Abstract 57

Healthy Sleep Habits in Young Children: Results of a Children's Museum Parent Survey

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Purpose: While sleep is clearly important for optimal functioning and good health in children, caregivers may lack knowledge regarding basic healthy sleep habits. The purpose of this study was to examine the association between sleep habits and parental knowledge and beliefs about healthy sleep. Methods: A convenience sample of parents visiting the Children's Museum of Manhattan were asked to complete a brief two page survey developed and

piloted by the authors to assess their child's sleep habits (12 items) and parental sleep beliefs (4 items) and sleep knowledge (10 items). Results: 253 parents (mean age 35.5±6.1 years, 61% white, 96% > high school education) completed the survey. Mean age of the children was 3.4±2.0; 54% female. Sleep habits: 23% do not have a consistent bedtime, 56% frequently fall asleep with an adult present, 23% have > 1 electronic device in the bedroom, 96% have a regular bedtime routine which includes television viewing in 33%, 5% consume caffeinated beverages daily. Compared to average recommended 24 sleep duration ranges for age, 24% of the children were getting inadequate sleep. Sleep beliefs: 52% of parents underestimated their child's average sleep needs for age; however, 80% reported that their child gets enough sleep and 74% believe their child has healthy sleep habits. Sleep knowledge: 35% of parents gave correct answers for <50% of the questions. There was no demographic variable differences between children getting adequate vs too little sleep or between-group differences regarding having an adult present at bedtime or TV viewing habits. Children getting an inadequate amount of sleep had significantly later bedtimes ($p < .001$); insufficient sleep was also associated with lack of a consistent bedtime (OR 2.48), and parental underestimation of sleep needs (OR 2.17). Conclusion: Even in a well-educated sample, parental knowledge of recommended sleep amounts and the importance of healthy sleep habits for young children is relatively low. Educational interventions to address this knowledge gap in a variety of settings are needed.

Abstract 58

Parents Perceptions of School-based Telemedicine for Rural Children with Special Health Care Needs

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Purpose: To qualitatively analyze parents' experiences with school-based telemedicine (TM) to connect to the medical home for children with special health care needs (CSHCN) for acute minor illnesses in 2 rural schools for children with developmental disabilities. Methods: We collected qualitative data in structured interviews and focus groups with parents to ascertain their perceptions of their child's TM experience. We analyzed data using grounded theory. Results: The study enrolled 152 children (mean age = 9.2 years). We performed 165 TM visits for 73 children. Four themes emerged from the parents' perceptions of TM. The first theme was Benefits/Challenges. Benefits include that the TM visit levels the playing field making medical care easier to use, provides more immediate access to care for acute illnesses, and is less disruptive to family routines. Parents reported that children with challenging behaviors were less stressed by a TM visit than by an office visit. Disadvantages of TM included delays in communication between the physician and parent if the visit occurs late in the day. The second theme was the Medical Home Concept. Parents perceived that their child received more appropriate care with their own primary care provider via TM rather than going to an urgent care or emergency room after the parent finished work. The third theme was Acceptance of Telemedicine. Parents were highly satisfied and considered TM visits to provide care of equal value as an office visit. The fourth theme was Future Directions. Parents want to expand TM care to include other types of medical services in addition to minor acute illnesses. Conclusion: School-based TM improves access to care for minor acute illnesses for rural CSHCN. Parents are highly satisfied with TM and plan to continue to use TM. Parents of children with behavioral challenges found greater benefit with a TM visit. Parents are willing to advocate for expansion of TM to include subspecialty care.

Abstract 59

Parenting Stress and Positive Social Behaviors: Are They Connected?

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Purpose: Research shows that parenting stress (PS) is higher in autism spectrum disorders (ASD) than in other

childhood conditions. ASD is characterized by a lack of positive social behaviors (PSB). The objectives of this study were 1) to compare PS and PSB for children with ASD vs. typically developing children and 2) to test the hypothesis that PS and PSB are more strongly correlated in ASD than among children with typical development. Methods: Analysis was conducted using the 2007 National Survey of Children's Health, a random-dial, cross-sectional, public use dataset. PSB and PS scales were created using questions from the interviews, where higher scores reflect better social skills and more parenting stress. Mean PS and PSB scores and the correlations between them were compared between 2 mutually exclusive groups: typically developing children and ASD. To be included, children had to be >6 and the respondent had to be the mother. Children in the typically developing group had no chronic health conditions. The ASD group included all eligible children who were reported by their parents to have ASD. Means were compared using ANOVA. Fisher's r to z transformation was used to compare correlation coefficients. Results: Parents of children in the ASD group had significantly higher PS (8.41, n>558) than parents of typically developing children (5.67, n>33,412). Children in the ASD group had significantly lower PSB scores (14.12) than typically developing children (17.48), both significant at $p < 0.001$. Correlations between PSB and PS were -0.333 in the ASD group and -0.349 in the typically developing group. These correlations were not significantly different. Conclusion: PS was higher and PSB lower in the ASD group compared to the typically developing group. Inverse correlations of comparable strength existed between PS and PSB for both groups. Further study is needed to investigate to what extent PSB contributes to PS in these and other chronic childhood conditions.

Abstract 60

Early Language Screening in the Course of Pediatric Preventive Medical Checkups

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Purpose: To evaluate the feasibility and effectiveness of screening for persisting language delay in the pediatric office at two years of life. Methods: 24 out of 36 pediatricians in the region of Upper Austria included all the children coming for a healthy baby check at two years of age into a language screening program. The procedure consisted of a parental checklist (adaptation of MacArthur CDI) of word production and a questionnaire on putative risk factors such as family history for language delay or parental concerns and a short assessment of word comprehension by the pediatrician. Perinatal risk factors were also included. At the age of three language was assessed by use of a German adaptation of the Mac Arthur CDI-3 parents wordlist. Results: In a logistic regression model with expressive vocabulary below or above 10% at the age of three as dependent variable only vocabulary at 2 years of age (OR .976***), maternal education (OR .434***) and single parenting (OR 2.17***) showed significant influence (Nagelkerkes $R^2 = .341$). The test of word comprehension was of no discriminative value. By use of ROC curves the cut value of the classification table was adjusted to achieve the highest possible combination of sensitivity (72%) and specificity (86%) . However, this led to a high number of predicted positives (92%) and a rather low PPV of 36%. Conclusion: With this model sufficient sensitivity and specificity was achieved. However, PPV still needs to be increased, e.g. by inclusion of other family or language variables (such as language comprehension) into the screening procedure. Nevertheless, acceptance of the procedure by parents and pediatricians was very high and costs were low. By offering parent counselling and group training programmes rather than child directed intervention expenses can be kept low, even though the majority of children probably would catch up without specific intervention. Due to a large variability in vocabulary in young children a second screening at the age of three is necessary.

Abstract 61

Use of Child Gender as a means of Improved Genetic Risk Assessment in the Autism Spectrum Disorders

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Purpose: The inheritance pattern in most cases of autism is complex. The risk of autism is increased in siblings of autistic children and the level of risk can be further identified by the accumulation of multiple susceptibility genes allowing for the identification of a high risk subgroup of individuals. As a result of the gender difference in the prevalence of autism, we explored the potential for identifying gender-specific autism susceptibility genes in siblings of autistic children and the ability to develop a gender-specific risk assessment genetic scoring (GS) system. **Methods:** Single nucleotide polymorphisms were chosen from genes known to be associated with autism and validated using a sample of 483 families which included at least two autistic children. Stability for the different markers were evaluated as the proportion of samples that provided an OR > 1.00 in males but not in females, in females but not in males, in both males and females. Differing GS models were then constructed to develop a gender specific risk score designed to identify individuals with a higher risk of autism **Results:** We identified 6 genes contributing to autism risk in males and 5 genes contributing to risk in females each significantly associated with ASD and developed a GS which demonstrated a significant association with autism ($p=2.2 \times 10^{-6}$ and 1.9×10^{-5} respectively). Assuming an accepted 10% sibling recurrence risk of autism and a 4:1 sex ratio, the sibling recurrence risk in males and females are estimated respectively to 16% and 4%. For males with a GS of greater than 9 points, the positive PPV was 24% (95% CI: 20%-29%) with a 0.23 sensitivity and a 0.86 specificity. For females, the PPV is 10% (95% CI: 7%-15%) with a 0.37 sensitivity and 0.85 specificity. **Conclusion:** Risk determination in male and female siblings of children with autism is improved by accounting for the gender in genetic risk scores.

Abstract 62
WITHDRAWN

Abstract 63

Traumatic Brain Injury Effects on School Readiness

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Purpose: To determine the likelihood that young children with a moderate or severe TBI will score lower than 85 points on age-specific measures of school readiness compared to children who sustained orthopedic injuries (OI). **Methods:** Children with TBI or OI participated in a longitudinal study examining the impact of TBI between the ages of 3 and 7 on child cognitive and behavioral functioning over the initial 18-months post injury. Of the 217 children enrolled, 157 children had valid baseline and 12-month follow-up data on measures of academic readiness and achievement. At-risk was defined as a standard score of less than 85 on any of the following measures: (Bracken, Woodcock Johnson: Applied problems subtest, spelling subtest, story recall subtest, or letter/word subtest). Those scoring 85 or above on all tests were considered not at risk for academic difficulties. **Results:** 16 children had Severe TBI, 49 with Moderate TBI, and 92 children had OI. At the 12-month follow-up, 31.2% of the Severe TBI group were considered at risk for academic difficulties compared to 16.3% in the Moderate TBI group, and 8.7% in the OI group. After controlling for baseline characteristics such sex, socio-economic status, family environment,

and age at injury, children with severe TBI were almost 5 times more likely to be at risk than those with OI (AOR = 4.9, $\chi^2 = 15.5$, $p = <.0001$). Conclusion: Results support prior research that children with Severe TBI have a greater risk of poor academic performance. The findings underscore the potential risk for academic difficulties among young children with Severe TBI. Unlike prior studies, however, these results hold true when controlling for economic and environmental conditions.

Abstract 64

Traumatic Brain Injuries in Preschool Age Children: Significant Problems with Behavior Two Years Following Injury

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Purpose: Behavior problems constitute one of the most common and troubling consequences of childhood traumatic brain injury (TBI), yet few studies have examined behavior problems in early childhood TBI over time using standardized measures. This study looked at the emergence of behavior problems during the initial 24 months following TBI in young children relative to a cohort of children with orthopedic injuries (OI). Methods: A concurrent cohort/prospective research design was used with repeated assessments of children aged 3-7 years with TBI or OI requiring hospitalization and their families. Parents of 100 children with TBI (23 severe, 77 mild to moderate) and 117 with OI completed The Child Behavior Checklist (CBCL) within 3 months post-injury and again 6, 12, 18, and 24+ months post-injury. Parents initial post-injury ratings were based on the child's functioning prior to the injury. Analyses of variance using race and baseline score as covariates were used to examine group differences in internalizing and externalizing behavior problems at each assessment. Results: The OI and TBI groups demonstrated significant differences in internalizing behavioral problems at six, $F(2, 163) = 4.04$, $p < .05$), twelve, $F(2, 152) = 6.09$, $p < .01$, eighteen, $F(2, 152) = 5.23$, $p < .01$, and twenty-four +, $F(2, 137) = 4.15$, $p < .05$, months. Similarly, significant group differences were seen in terms of externalizing behavior problems at six, $F(2, 163) = 10.64$, $p < .001$, twelve, $F(2, 152) = 5.15$, $p < .001$, eighteen, $F(2, 152) = 4.55$, $p < .05$, and twenty-four +, $F(2, 137) = 4.61$, $p < .05$ months. Subsequent pairwise comparisons indicated that the severe TBI group had significantly higher scores, indicative of worse functioning, than the OI group. Additionally, at the 12-month follow-up, both the moderate and severe TBI groups had higher levels of behavior problems than the OI group. Conclusion: Results suggest that both moderate and severe TBI are associated with post-injury increases in externalizing and internalizing behavior problems and that these problems fail to resolve over time. Understanding the emergence and persistence of behavioral problems in young children with TBI has critical implications for developing interventions.

Abstract 65 & 66

WITHDRAWN

Abstract 69

Barriers to Autism Screening in Family Medicine Practice: A Qualitative Study

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Purpose: To explore potential barriers to adoption of recommended screening for autism by family physicians at the 18 and 24 month well child visits. This study focuses on physician attitudes about autism and the screening process, and the role of attitudes as potential barriers to autism screening. **Methods:** Three focus groups and six interviews were conducted with 15 family physicians in the Kansas City metropolitan area using a semi-structured format. Verbatim transcripts were inductively coded and data were analyzed using standard text analysis. **Results:** Participants had differing views on the increased incidence of autism. Most participants attributed the increase to change in diagnostic criteria. There was no consensus about the benefit of implementing universal screening for autism during the 18 or 24 months visits. Many preferred to identify potential problems via general developmental assessments and observations. No participant used autism specific screening tools, and only one participant was aware of such a tool (M-CHAT). Participants wanted a stronger evidence base showing the benefits of routine screening, rather than policy guidelines based on expert opinion. Lack of adequate training about child development and screening methods, and limited availability of community based resources to manage children with autism were seen as major barriers to routine screening. Suggested solutions included stronger evidence base to show the benefit of screening, continuing education, and better resident training in child development and behavior. **Conclusion:** Universal screening for autism at the 18 and 24 months visits is not widely accepted or implemented by family physicians.

Abstract 71

Impact of Guanfacine Extended Release on Cognitive Problems and Inattention

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Purpose: To further examine the effect of guanfacine extended release (GXR; Intuniv™ Shire Development Inc., Wayne, PA) on inattention and cognition in subjects treated for attention-deficit/hyperactivity disorder (ADHD). **Methods:** In an 8-week treatment, double-blind, forced-dose escalation study, subjects aged 6-17 years with ADHD were randomized to placebo (n=86) or GXR once daily at 2 (n=87), 3 (n=86), or 4 mg/d (n=86). The Cognitive Problems/Inattention subscale of the Conners' Parent and Teacher Rating Scales-Revised: Short Forms (CPRS-R and CTRS-R, respectively) were completed at baseline, week 4, and week 5. Spontaneously reported adverse events (AEs) were collected at all visits. **Results:** Placebo-adjusted least squares mean reductions from baseline to endpoint in mean day CPRS-R Cognitive Problems/Inattention scores were significant for all GXR dose groups: -2.02, -1.92, and -2.58 for the 2-, 3-, and 4-mg/d groups, respectively (P<0.04 for all). Results for CTRS-R Cognitive Problems/Inattention scores were similar: -1.60, -1.50, and -1.71 for the 2-, 3-, and 4-mg/d groups, respectively (P<0.01 for all). Most treatment emergent adverse events (TEAEs) were mild to moderate in severity. TEAEs of somnolence, sedation, and hypersomnia (SSH) were reported by 44.2% of subjects receiving GXR. Most SSH TEAEs were mild (54.6%) or moderate (36.8%) in severity, occurred during the first 2 weeks of dose optimization, and did not result in discontinuation. **Conclusion:** Among children and adolescents with ADHD, treatment with GXR resulted in significant improvements in parent- and teacher-reported cognitive problems and inattention. This supports previously reported findings of improvement in inattentive symptoms with GXR. Most TEAEs were mild to moderate in severity.

Abstract 74

Health and Sexual Education: Youth with Moderate to Severe Intellectual Disability

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Purpose: To inform the design and modification of health and sexual education resources for youth with moderate to severe intellectual disability, given their high risk for unwanted pregnancy, sexually transmitted infections, and abuse, and the few resources adapted to their unique needs. Methods: Using a community-based participatory research approach, we developed semi-structured qualitative interviews on health and sexual education needs, facilitators, and barriers, and interviewed principals (n=5), nurses (n=2), psychologists (n=3) and teachers (n=13) at four special education centers in a large urban school district from January 2007 to June 2008. Three reviewers used content analysis and grounded theory methodology to independently code the verbatim interview transcripts and identify key sub-themes. To enhance reliability, a fourth investigator independently reviewed the coded transcripts and sub-themes identified. Results: Most stakeholders identified no current formal sexual education programs. Key sub-themes for health and sex education knowledge needs were: normal development, hygiene, inappropriate/appropriate behaviors, sexuality, birth control, sexual abuse, and youth self-esteem. Individual and group settings were proposed for delivering youth and parent education, with programs tailored to youth cognitive level, behaviors, and diagnoses. Most stakeholders believed a team approach including teachers, nurses, and psychologists should be offered through the school, with linkages to community resources. Key barriers identified included parent denial around youth puberty and sexuality; parents' work schedules, transportation, and child-care needs; a lack of staff with specialized training in sexual education; and an academic focus for Individualized Education Plan (IEP) goals. Key facilitators identified were youth motivation to learn about sexuality, small group settings in special education centers, and the format for annual IEP meetings. Conclusion: Through this collaborative research project, we identified several primary barriers and facilitators that will be used to inform the design and delivery of a health and sexual education program.

Abstract 75

Outpatient Early Intervention and Therapeutic Services (OEITS) Utilized by Infants in High Risk Infant Follow-Up (HRIF) Programs in California: Initial Results of a Quality Improvement and Research Network.

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Purpose: To evaluate and compare OEITS utilization among different birth weight (BW) groups of infants who are at high risk for neurodevelopmental problems following NICU discharge. Methods: A primary analysis of a population-based data set from a network of HRIF programs supported by California Childrens Services as part of Title V. Infants qualified for HRIF based on CCS-defined neonatal medical risk factors. Standardized visits and assessments were conducted through 36 months of age, the first of which occurred at 4-8 months. OEITS utilized were collected from the medical record and caregiver report. Early intervention consists of a government-funded program. Therapeutic services range from feeding therapy to home nursing to occupational therapy. The study population was divided into 4 groups based on standard BW classifications. Descriptive statistics determined the distribution of OEITS utilized by BW group. Results: Almost a third of infants in this sample population were utilizing 1 or more OEITS by the first visit, with the ELBW group having the highest % (Table). The NBW group had the highest % of children utilizing 3 or more OEITS. Developmental care (7%) and physical therapy (9%) were the most utilized therapeutic services. The ELBW group had the highest % of infants utilizing early intervention followed by the NBW group. Conclusion: The distribution of OEITS utilized within the first year after NICU discharge is consistent with the medical morbidities expected for this population. A high proportion of NBW infants utilized several OEITS, underscoring their neurodevelopmental vulnerability is as significant as those of lower BW. This data has the potential to be used for the planning of public health programs.

	ELBW, <1000g	VLBW, 1000-1499g	LBW, 1500-2499g	NBW, 2500g+	Total
	n=337 (%)	n=573 (%)	n=451 (%)	n=493 (%)	N=1854 (%)

1 or more OEITS	167 (50)	170 (30)	98 (22)	166 (34)	601 (32)
3 or more OEITS	29 (9)	34 (6)	28 (6)	48 (10)	139 (8)
Early Intervention	113 (34)	95 (17)	61 (14)	106 (22)	375 (20)

Abstract 76

Association Between ADHD Clinical Characteristics and Quality of Life Domains

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Purpose: We explored the relationships between ADHD clinical characteristics and different health-related quality of life (HRQL) domains. Methods: We analyzed data from a larger study on ADHD information exchange. Parents of children with ADHD reported on ADHD symptoms, ADHD medications and side effects, and HRQL using the 50-item Child Health Questionnaire (CHQ-50). Primary outcomes were scaled scores (range 0-100, higher indicates better HRQL) for each of the 10 CHQ-50 domains. We analyzed the effect of ADHD clinical characteristics (disease control-good/poor; screen for co-morbid conditions-positive/negative; medication side effects- minimal/significant; ADHD care environment-streamlined/complex) on each domain using multivariate linear regression adjusting for child age, gender, and race/ethnicity. Models for parent-focused domains also adjusted for parent birth outside of the United States and use of the internet (a proxy for socioeconomic status). Results: HRQL scores were lower for Parent Emotional Impact (51 ± 24) and Behavior (53 ± 21) and higher for physical function domains. Overall, ADHD clinical characteristics contributed differently across the 10 HRQL domains. For example, good disease control and negative co-morbidity screen were significantly associated with higher Behavior and Social-Emotional Role Limitations scores, while minimal medication side effects and negative co-morbidity screen were associated with higher Mental Health scores. Self-Esteem scores were higher if there was good disease control, a streamlined care environment, negative co-morbidity screen, and younger child age. Older child age, good disease control, and minimal side effects contributed toward higher Parent Time scores, but higher Parent Emotional scores were significantly associated with older child age, parent birth in the US, good disease control, negative co-morbidity screen, and a streamlined care environment. Conclusion: ADHD symptom control, medication side effects, symptoms of co-morbidities, and ADHD care team structure contribute differently to different domains of HRQL. Scores for specific HRQL domains can thus help establish treatment priorities for ADHD.

Abstract 78

Brain-Derived Neurotrophic Factor in WAGR Syndrome and Autism Symptoms

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Purpose: WAGR syndrome is a rare genetic disorder caused by heterozygous chromosome 11p13 deletions of variable size. Due to its role in brain development and function, we hypothesized that haploinsufficiency of brain-derived neurotrophic factor (BDNF), a gene that is often deleted in patients with WAGR syndrome, may play a role for autism spectrum disorder (ASD) development in this population. Methods: Twenty patients with WAGR syndrome (10F/10M, age 6-37y) were recruited to the NIH through the International WAGR Syndrome Association. ASD symptoms were assessed using Autism Diagnostic Interview-Revised (ADI-R, parent interview, N=20), Autism Diagnostic Observation Schedule (ADOS, direct behavioral observation, N=15), and clinical judgment of doctoral level psychologists. Deletion boundaries were determined by array comparative genomic hybridization. Prevalence of ASD was compared by Fisher's exact test. Results: The deletion sizes ranged from 2.9 to 15.1 Mb. Thirteen subjects had heterozygous BDNF deletion (+/-) while 7 had intact BDNF (+/+). All but one subject met criteria for

mental retardation, ranging from mild to severe. Visual impairment ranged from legal blindness to complete lack of vision. Using ADI-R, 7 out of 13 BDNF+/- subjects met "ever" ASD criteria compared to none out of 7 BDNF+/+ subjects [54% (95% CI: 25-80%) vs. 0% (95% CI: 0-41%), $p=0.04$]. However, using ADI current codes, ADOS, and clinical judgment, only 1 out of 9 BDNF+/- subjects met ASD criteria (with 1 other also meeting criteria only on the ADI-R) compared to none out of 6 BDNF+/+ subjects [11% (95% CI: 0-48%) vs. 0% (95% CI: 0-45%), $p=1.00$]. Conclusion: Because WAGR syndrome includes visual impairment, mental retardation, and serious medical illness in early childhood, current functioning may be more reliable than ADI-R "ever" codes in assessing autism symptoms in this population. Further exploration of cognitive and/or visual impairments is needed to validate the observation of an association between BDNF haploinsufficiency and a history of autism symptoms. (This research was supported by the Intramural Research Program of the NICHD and NIMH, NIH.)

Abstract 79

A Volunteer Program in the OPD to Improve the Early Detection of Developmental Delays

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Purpose: The timely identification of children with developmental delays is an important aspect of primary care. This study was undertaken to document the efficacy of a volunteer-run program in the outpatient clinic designed to detect delays in 9 to 30 month old children. Methods: Intervention group: A convenience sample of English and Spanish speaking families waiting for well child care in an urban hospital-based clinic participated. Premature and chronically ill children were excluded. Trained volunteers met individually with families. The volunteers asked about the child's current developmental attainments and any history of referrals to early intervention or a developmental specialist. They reviewed age appropriate milestones, elicited any parental concerns, and assisted the parents in marking any concerns on a developmental passport to be given to the pediatrician. A tracking form was generated for any child with suspected developmental delays and given to the clinic coordinator. All data was entered onto a spreadsheet. The spreadsheet and medical charts were reviewed by the investigator once the children reached 30 months ($n=50$). Control group: A retrospective chart review ($n=265$) was conducted on a comparable group of patients who had reached 30 months in the year prior to the initiation of the project in order to establish a baseline referral rate to early intervention or developmental services. Results: The referral rate in the control group was 19% (50/265). The referral rate in the intervention group was 32% (16/50). The difference in referral rates was significant (chi square= 4.38, $p < .05$). Speech and language were the predominant concerns in both groups. The average age at referral for communication problems was 22 months in both groups. Conclusion: The volunteer program significantly increased the number of referrals. Its advantages include its modest cost, the help it provides to low health literacy parents who may have difficulty filling out questionnaires designed to elicit their concerns, and the tangible developmental passport that facilitates a discussion of development with the pediatrician.

Abstract 80

The Effect of Drug Testing in Reducing Drug Use by Adolescents with Substance Use Disorders

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Purpose: To explore how random drug testing impacts behavior of adolescents participating in an outpatient substance abuse program. Methods: We conducted 12 individual parent interviews and 4 focus groups (opioid dependent adolescents ($n=4$), teens with an alcohol and/or marijuana disorder ($n=5$), and 2 with their parents ($n=8$) to discuss how random drug testing impacts behavior. All research participants had experience with drug

testing. We facilitated focus group discussions using a semi-structured interview guide; field notes were taken by 2 or more research assistants per session. Authors reviewed field notes, discussed major themes and then presented a summary to the original participants for confirmation. Results: 11/12 of the parents interviewed individually and all focus group participants believed that drug testing helped reduce their substance use. Opioid dependent adolescents reported that drug testing only reduced use when they were ready to accept treatment. Adolescents with other drug disorders seemed more susceptible to parental pressure to stop using drugs even if they were not seeking treatment. All adolescents said that seeing negative tests and parental praise helped reduced use, while punishments (grounding, etc.) led to cravings. Most parents used at least one punishment though almost all said these led to negative behaviors (yelling, arguing, etc.). One parent believed expressing disappointment helped her child without escalating behavior. Conclusion: Preliminary findings suggest that drug testing may help adolescents in treatment to reduce drug use. Rewards and simple disapproval appear to be a much more effective than punishments, though authors caution that logical consequences for safety (such as suspending driving privileges) may be necessary even if they escalate behavior. Outcomes may be associated with the underlying disorder and readiness to accept treatment. Further focus group discussions will confirm whether these findings are consistent, and explore the efficacy of internal rewards (improved self esteem) and verbal praise as compared to material rewards.

Abstract 81

A State-wide Survey of Adolescent Substance Use Screening Rates and Practices in Primary Care

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Purpose: To describe attitudes towards screening, screening rates and screening practices used by physicians practicing in Massachusetts. Methods: Survey questionnaire mailed to physicians registered with the Massachusetts Board of Registration in Medicine as practicing pediatrics (N=2,176) family medicine (N=1,335) or both (N=8). Results: Out of 3,377 surveys that reached the intended address, we received 926 responses for a response rate of 27%. Among the returned surveys, 183 did not treat adolescents and were excluded from analyses, leaving a final analysis sample of 743 respondents. More than 90% of respondents agreed or strongly agreed that primary care physicians should screen adolescents for substance use. A large majority of respondents (86%) reported that they screen adolescents for substance use annually with younger physicians significantly more likely to do so than their older colleagues (92.4% vs. 79.4%, chi-square=26.7, df=3, p<.001). Less than 1% of respondents reported that they do not screen adolescents for substance use at all. Fifty-nine percent of respondents did not use a validated screening tool, 33.9% said they use the CRAFFT and 7.5% said they use the CAGE. Family practice physicians were as likely to use the CAGE as the CRAFFT (17.4% vs 16.1% respectively), while pediatricians were far more likely to use the CRAFFT over the CAGE (43.2% vs. 2.6%). Conclusion: Physicians agree that adolescents should be screened for substance use, and screening rates appear to be improving over time. However, many physicians are using ineffective screening practices. Further physician training could improve the effectiveness of routine screening for alcohol and drug use by adolescents.

Abstract 84

An Abbreviated Screen for Autism Spectrum Disorders

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Purpose: To pilot test an abbreviated and simplified screening checklist for autism, intended for parents to complete prior to primary care visits. Methods: The Parent's Observations of Social Interactions (POSI) is a 7 item checklist intended to identify risk for Autism Spectrum Disorders (ASD) in young children, but it has not yet been validated. Parents requesting an evaluation for their child of <5 years old at a tertiary developmental center completed the M-CHAT and the POSI prior to the clinical evaluation. Results of the two checklists were compared to the outcome of the clinical evaluation. Results: Of the 117 children evaluated over a six month period in 2009-10, 62 (53%) received a clinical diagnosis of an ASD. Of these, 41 had a positive score on the M-CHAT and 42 had a positive score on the POSI. Among those children who did not receive a diagnosis of an ASD, 31 were correctly identified by the M-CHAT and 43 by the POSI. Based on these findings (see Tables) the M-CHAT had a sensitivity of 66.1%, specificity of 56.4%, and positive predictive value (PPV) of 63%. The POSI had a sensitivity of 67.7%, specificity of 78.2%, and PPV of 77.8%. Conclusion: The POSI appears to provide equally good sensitivity, and better specificity and positive predictive value compared to the M-CHAT in this initial study. If these data are reproduced in larger and more diverse samples, the POSI may provide an efficient alternative for primary care screening for autism.

	M-CHAT +	M-CHAT -	Total
Clinical Diagnosis of ASD	41	21	62
Clinical Diagnosis not ASD	24	31	55
Total	65	52	117
	POSI +	POSI -	Total
Clinical Diagnosis of ASD	42	20	62
Clinical Diagnosis not ASD	12	43	55
Total	54	63	117
	M-CHAT	POSI	
Sensitivity (%)	66.1	67.7	
Specificity (%)	56.4	78.2	
Positive Predictive Val (%)	63	77.8	

Abstract 85

The Effect of a Relationship-based Neurobehavioral Intervention on parents' Understanding of their High-risk Newborn.

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Purpose: Parents of high-risk newborns demonstrate elevated rates of depression and anxiety. High-risk newborns demonstrate neurobehavioral difficulties that interfere with feeding, sleeping, and social interaction. Early intervention (EI) can ameliorate these difficulties, however, many EI clinicians are not trained in the unique needs of the high risk parent-infant dyad. Methods: This was a multi-site randomized controlled trial. Families of newborns referred to EI were randomly assigned to an intervention or usual care group and followed until the infant was 12 weeks corrected gestational age. The intervention group received weekly home visits by a clinician

certified in the Newborn Behavioral Observation (NBO)- a neurobehavioral, relationship-building tool designed to simultaneously highlight the infant's strength and areas of difficulty while promoting optimal parent-infant interaction. The control group received weekly home visits by an EI provider. Parents completed the Home Visiting Index -- a 25 item index measuring the quality of home visits using three subs-scales: advice, engagement and support, and knowledge and contingent response to baby's cues. Mixed linear regression was used to examine differences between groups. Results: The study cohort includes 38 families (control=25, experimental=13) across 3 EI programs. Study newborns were predominantly white (74%), low birth weight (53%), and male (61%); nearly 3/4 had newborn intensive care hospitalizations (71%); 1 in 5 had feeding difficulties (21%); about 1 in 3 lacked family social supports (32%), and 60% had mothers with at least some post-high school education. There were no differences between the groups with regard to socio-demographic or medical characteristics. We found no group differences in overall scores, home visitor's advice and home visitor's engagement/support of parents, but the experimental group demonstrated, on average, a statistically significant ($p=0.02$) 3-point higher score (mean difference = 2.17, 95% CI: [0.41, 3.92]) on parent's knowledge of their baby. Conclusion: Integrating a neurobehavioral, relationship-building tool such as the NBO into EI home visiting promotes parent's understanding of their baby's neurodevelopment and optimal parent-infant interaction.

Abstract 88

Associations between Family Factors, Emotional/Behavioral Functioning and Child BMI in a Cohort of Chilean 10-yr olds

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Purpose: This study examined potential mechanisms explaining the relationship between maternal education and the home environment on BMI in Chilean 10-yr olds. Methods: We assessed 1126 10-yr-old children who were part of an infancy iron deficiency anemia preventive trial and follow up study. Structural equation modeling was used to examine pathways from family factors to child BMI through parenting and child emotional/ behavioral functioning. The tested model showed acceptable fit indices (CFI=91, RMSEA=.03, SRMR=.04). Results: Descriptive statistics are in Table 1. Mothers with higher education promoted more family recreation ($B=.02$) which was associated with a positive parent-child disciplinary approach ($B=.44$), fewer child somatic complaints ($B=-.26$), lower child depressive symptoms ($B=.40$), less overeating ($B=.22$) and lower child BMI ($B=14.5$). Physical home environment was also related to child BMI through the parent-child disciplinary approach mechanism described above ($B=.25$). In addition, the physical home environment was related to greater parent-child interaction ($B=.19$), higher child self-esteem ($B=1.2$), lower child depressive symptoms ($B=-.14$), which was indirectly related to lower BMI as mentioned above. All associations were significant at $t>1.96$. Conclusion: In a cohort of Chilean 10-yr olds with a high prevalence of overweight and obesity, higher maternal education and better physical home environment related to parenting and child emotional/behavioral functioning resulting in lower BMI.

Table 1. Characteristics of Chilean 10-yr-olds

MATERNAL	Mean±SD or %
Education	9±3
BMI	29±5
CHILD	
Male	54
BMI %ile	70±26

Too sick to play	40
Overeats	57

Abstract 89

Anticipatory Guidance needs in Parents of Children ages 0 to 6 years at Well Child Examinations

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Purpose: Adequate discussion of all recommended anticipatory guidance topics in the limited time of well-child visits is unrealistic. Only a few selected topics are discussed at each visit. While parent-directed education has been shown to cover more topics, physician-selected education appears to produce more overall satisfaction. This study aimed to discover what parents wish to learn in order to help physicians prioritize their discussion topics. Methods: Suggested anticipatory guideline topics for ages 0 to 6 years from *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, 3rd Edition*, were categorized into 14 major topics and included in a survey. The surveys were distributed to parents at a single academic primary care pediatrics clinic along with other check-in materials at well-child exams. Parents were asked to rank their top 3 topics of interest at the current visit. The surveys were collected anonymously during check-out. Results: Between January 19, 2009 and November 30, 2009, there were 3,474 well-child examinations of children ages 0-6 years at the primary care clinic. A total of 425 surveys were collected during this period. At least 1 topic was identified as a need in 82.6% of surveys. The most commonly identified topics overall were normal development, 41.4%, feeding, 40.7%, discipline and behavior, 23.8%, and sleep, 23.1%. The most popular topics at various ages were: 0-3 months: feeding, 50.0%; 4-8 months: diet, 67.9%; 9-14 months, normal development, 54.0%, discipline, 41.9%; 15-23 months: discipline, 41.9%; 2 years: toileting, 47.2%; 3 years: discipline and normal development, 42.5% each; 4 years: normal development, 31.4%; 5 years: discipline, learning, and normal development, 41.7% each; 6 years: normal development, 40.0%. Conclusion: The anticipatory guidance topics most important to parents vary for each age group of children, but always include normal development. This data will allow clinicians to make their educational discussions at each visit more relevant to parents. It can also be used to structure and improve primary care resident education.

Abstract 91

Friendship Quality and Social Behavior of Pediatric Brain Tumor Survivors

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Purpose: To examine friendship quality in pediatric brain tumor survivors (BTS) relative to comparison classmates (CC) and examine the extent to which perceptions of friendship quality varies as a function of behavioral reputation. Methods: BTS (n=42), ages 9-18 (12.3 2.5) and 1-6 years post treatment, were recruited from two pediatric oncology centers. Classmates (n=39) matched for gender, race, and age were recruited for a comparison group. Data included peer report on the Revised Class Play (Masten, Morison, & Pellegrini, 1985) which measures childrens patterns of behaviors and social interaction on five dimensions including Leadership-popularity, Prosocial, Aggressive-disruptive, Sensitive-isolated, and Victimization. The Friendship Quality Questionnaire-Revised (Parker & Asher, 1989) was completed by BTS and CC. This self-report measure assesses the extent of Companionship and recreation, Help and guidance, Validation and caring, Conflict and betrayal, Conflict resolution,

Protection, and Intimate disclosure characterizing the relationship with a best friend. Results: No significant group differences were found on subscales measuring friendship quality. BTS were rated higher on Victimization and Sensitive-isolated, and lower on Leadership-popularity. Victimization and Sensitive-isolated behavior were associated with multiple dimensions of friendship quality for CC. For example, they were negatively correlated with positive friendship qualities (e.g., Validation and Caring, Help, and Protection). Correlations for BTS were non-significant. Fischer z transformations indicated that correlations between friendship quality and social behavior were significantly different for BTS and CC, particularly with Victimization and Sensitive-isolation. Conclusion: Although survivors experience deficits in social behavior, it appears that when compared to classmates, they perceive having similar quality relationships with their best friend. Negative social behaviors were related to friendship quality in the expected direction for classmates, however there was no association between behavior and friendship quality for survivors.

Abstract 92

Markers of Maternal Depression in an Urban Pediatric Clinic

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Purpose: To identify markers of maternal depression in pediatric medical records of children less than 5 years old. Methods: This study is part of a larger study of mothers who were screened for depressive symptoms at well child visits from June 2007 - June 2008 in an urban pediatric clinic. The Quick Inventory of Depressive Symptomatology (QIDS) was the screening measure used. A case-control methodology was utilized in which cases are mothers who had a positive screen on the QIDS & controls are mothers who had a negative screen. Three categories of factors were collected from the child's medical record: 1) maternal factors such as age at delivery, social work (SW) referral and child protective services referral (CPS); 2) child health care utilization such as ED visits, hospitalizations and missed appointments; and 3) child health such as prematurity and reports by the mother of behavioral, sleep & speech concerns. Results: To date we have collected data on 92 cases and 197 controls. Under maternal factors, a mother with a history of depression (OR: 2.8, CI: 1.2-6.5) and who is involved with SW services (OR: 1.9, CI: 1.1-3.2) is more likely to screen positive for depression. In contrast, the chances of screening positive for depression is not significantly different in both groups with regards to being a single mother and involvement with CPS. Under child health, mothers who reported about behavior concerns about their children are more likely (OR: 2.5, CI: 1.4 - 4.4) to screen positive for depression. In contrast, maternal reports of speech and sleep concerns are not significantly different between the two groups. Under child healthcare utilization, both groups are not significantly different in terms of the variables in this category. Conclusion: These preliminary results indicate that there is information from pediatric medical records that can be used as markers for maternal depression. In this study, mothers who screened positive for depression were substantially more likely to report behavioral problems prior to the screen. These mothers were also more likely to be recognized as depressed at previous health encounters and referred for social work services.

Abstract 93

Which Children Fail Classroom Behavior Management? Comparing Methods

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Purpose: To explore the potential of school screening to identify children at risk for disciplinary problems, comparing 3 procedures for scoring teacher ratings: (1) standard clinical; (2) statistical modeling; or (3) decision

rules from information theory. Methods: Vanderbilt Teacher ADHD ratings were completed online via CHADIS for all 5727 consented children in grades 1-5, yielding 1174 (20%) positive for ADHD. At year-end, disciplinary interventions were noted by teachers for children positive for ADHD and 102 random negative children. These schools utilize a hierarchical disciplinary system. Disciplinary outcome was defined as an office referral implying a failure of classroom management. Vanderbilt Teacher rating data was used to predict this outcome: (1) Standard ADHD Clinical groupings: Oppositional/Conduct; Anxiety/Depression; (2) Factor analytic derived groupings; (3) Classification and Regression Trees (CART) analyses which select one variable at a time that best differentiates the independent variable. Analytic models were developed on one subset of data and tested on another. For these analyses the 7 standard Vanderbilt performance items were divided into subscales of: 3 achievement, 2 executive functioning, and 2 behavior. Results: Standard Vanderbilt Groups yielded % disciplined (or PPV): ADHD + OD/CD (125) 67.7%; ADHD Combined (246) 52.8%; ADHD Hyperactive (116) 38.8%; Any ADHD (807) 35.1%; ADHD Inattentive (445) 26.7%; No ADHD (108) 7.8%. CART analyses yielded subgroups with better prediction; the best being: 100% for 26 children with high OD/CD symptoms (>1.5) >8.2 yrs old; 94% for 16 boys >8.4 yrs with a somewhat or worse behavior performance score (>7.5) and worse than average executive performance score (>10.5); 81% for 131 boys with high ADHD score (>26.5) and average or less behavior performance. Others (213) were in groups with lower PPVs (60-77%). Factor analytically derived groups included one predicting at 80% comprising a mix of inattentive/hyperactive/ODD/poor peer relations (70) and 3 other groups predicting 68-79% for 299 children. Conclusion: One goal of school ADHD screening is to avoid discipline. Standard teacher ratings identify more children than feasible for intervention. Derived groupings were found to predict office referral better than standard groups and CART better than factor analysis. Teacher ratings of behavior performance are better predictors of discipline than ADHD symptom scales.

Abstract 95

Early Neurodevelopmental Outcomes of Infants with Congenital Heart Disease

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Purpose: Children who undergo surgical repair for congenital heart disease (CHD) are at increased risk for developmental concerns. Infant CHD is associated with higher rates of gross and fine motor difficulties, language and attention concerns, and emotion and behavioral regulation problems, especially during school age. The effect of developmental delays or deviations can often be reduced if detected early, thoroughly evaluated, and systematically treated. However, limited data are available describing the early developmental status of infants with CHD. The objective of this study is to examine the early outcomes of infants with CHD following cardiac surgery. Methods: Subjects included 12-19 month old infants (N=30, mean age =13.66 months) who were seen in an infant cardiac neurodevelopmental follow-up program. Severity of the cardiac condition and repair varied from a simple surgical repair for ventricular septal defect to multiple surgeries for more complex conditions such as hypoplastic left heart syndrome. All subjects underwent a comprehensive neurodevelopmental battery which included the Bayley Scales of Infant Development (BSID-III) and the Receptive-Expressive Emergent Language Test (REEL-3). Results: Findings at one-year of age indicate uneven performance on the BSID-III. Cognitive skills were solidly in the Average range (Scaled Score (SS)=11.10 \pm 6, Age equivalence (AE) =14.6 months). In contrast, Receptive Communication (SS=9.76 \pm 4, AE =13.23 months); Expressive Communication (SS=9.03 \pm 5, AE =12.73 months); and Fine Motor skills (SS=9.58 \pm 7, AE =13.06 months) were within the average range but reduced relative to overall cognitive functioning outcomes. Performance on the REEL-3 indicated Receptive Language (Standard Score=90) and Expressive Language (Standard Score=86) skills one-half to nearly a full standard deviation below expectations. Further, BSID-III Gross Motor skill scores (SS=7.0 \pm 5, AE =11.68 months) were

significantly reduced with performance in the Low Average range. Fifty-five percent of infants received Early Intervention services post-surgery. Conclusion: Motor and language delays are prominent in this sample of young children with CHD, often requiring early intervention support. Future work will examine developmental outcomes across a range of CHD severity. Findings from this study inform recommendations for routine neurodevelopmental follow-up for children with CHD.

Abstract 96

How Accurate are Clinical Impressions, Based on a Parent Interview and Informal Observation of the Child in Clinic, in the Assessment of Attention Deficit Hyperactivity Disorder?

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Purpose: The purpose of this study is to determine the validity and diagnostic utility of clinical impressions generated from a clinical interview of the parents and informal observation of the child in the clinic setting in the diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). **Methods:** The study consisted of 104 patients between 6 and 12 years of age that were referred for evaluation of suspected ADHD. Clinicians conducted a semi-structured interview with the parents. The child was present (informal observation) during all or part of the parent interview. Immediately after the interview and informal observation, the clinicians rated whether or not they felt the child had ADHD (Yes/No) and their confidence in this diagnosis (1 = No confidence, 5 = High Confidence). Clinicians were blind to parent and teacher rating scales, a structured diagnostic interview, and testing data that were obtained as part of the study. Spearman correlation was used to determine associations between the clinician's confidence in the diagnosis of ADHD and other behavior rating measures. The classification utility of clinical impressions was examined using several quality indices. **Results:** The clinician's confidence in the diagnosis of ADHD based on parent interview and patient observation showed small to medium correlations with other measures of ADHD. The diagnostic utility of clinical impressions was fair to moderate. **Conclusion:** A number of tools are available to aid in the diagnosis of ADHD. Clinicians differ in which tools they implement and how much weight is placed on each of these tools. This study showed that the information obtained during an interview and observation in clinic alone may not be sufficient to make a diagnosis of ADHD, and that a variety of assessment tools should continue to be utilized in the evaluation of ADHD.

Abstract 97

Predictors of Parental Posttraumatic Stress after Adolescent Traumatic Injury

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Purpose: This study aims to evaluate factors associated with the development of posttraumatic stress disorder symptoms (PTSS) in parents of adolescents who experience a traumatic injury. **Methods:** 98 parent-adolescent pairs participated. Adolescents were admitted to a Level I Trauma Center after injury. Exclusion criteria included self-inflicted injury and injury too severe for participation. Data were collected within 30 days (baseline) of injury and 2, 5 and 12 months after injury. Injury-related variables (injury severity score (ISS), length of hospitalization, ICU days), parental variables (age, gender, baseline PTSS, number of preinjury traumatic events, number of postinjury stressful life events, parent rating of adolescent general health) and adolescent variables (age, gender, baseline and 5 month PTSS, baseline and 5 month depressive symptoms and self-rated baseline pain) were investigated. The outcome variable was inverse transformed for regressions. Separate linear regressions were

initially conducted for injury-related, parental and adolescent variables. Variables with $p < 0.1$ were considered in the final model. Results: Parents were 79% mothers with mean age of 44 ± 7 years. Adolescents were 67% male with mean age of 16 ± 2 years. Mean ISS was 10 ± 7 (max. 29). Length of hospitalization was 5.5 ± 6.5 days (range 1-44). 33% spent time in the ICU. At baseline, 24% of parents had levels of PTSS consistent with posttraumatic stress disorder, and 54% showed significantly elevated PTSS. By 12 months after injury, 5% and 25% of parents reached these symptom levels respectively. Higher parental baseline PTSS ($\beta = -.456$, $p < 0.001$), more parental postinjury stressful life events ($\beta = -.232$, $p < 0.02$), higher adolescent 5-month PTSS ($\beta = -.412$, $p < 0.02$) and lower adolescent baseline depressive symptoms ($\beta = .358$, $p < 0.01$) were all significantly associated with higher parental 12-month PTSS. This model explained 50% of the variance in the risk for development of PTSS. Conclusion: Parental PTSS are present after adolescent injury and may have a significant negative impact on parenting, family functioning and adolescent recovery. Both parental and adolescent factors appear to be important and represent potential points of intervention.

Abstract 98

Teaching Clinical Skill Assessment of Normal Child Development to Medical Students: An Integrated, Evidence-based Approach

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Purpose: We have integrated several published strategies on teaching normal development clinical skills into a small group learning experience for Year 2 (preclinical) students to address practical and logistical problems of approaches used individually. The components are live parent-child dyads, video clips and use of a standardized screening tool. This study examines effectiveness of this integrated approach using student evaluations. **Methods:** Year 2 medical (MS) and dental (DS) students are divided into small groups for a 2-hour clinical skills block in normal child development. After orientation, groups rotate through three 30-minute stations, each set up with a volunteer parent-child dyad, appropriate toys, and a preceptor. The developmental stages represented are infant, toddler, and pre-school/ kindergarten. Parents interact normally with their child and provide developmental history as requested. The preceptor's role is to encourage interaction between the parent-child dyad, to help students make naturalistic observations about development and ask appropriate history, and to demonstrate the use of a screening tool, the Ages and Stages Questionnaire (ASQ). Rooms are equipped with a computer and flat screen TV with immediate access to DVD video clips for back-up should there be not enough live parent-child dyads, if a child becomes ill or if during the session a child becomes fatigued or non-cooperative. DVDs were prepared in advance using volunteer families to mirror an ideal educational experience. **Results:** Of 193 students, 191 attended sessions (156/158 MS, 35/35 DS), and 178 consented to participate study and completed evaluation forms (92% participation). Evaluations used a Likert scale (1 = low, 5 = high). Students ranked the overall experience 4.6 with a range of 4-5. On two occasions, families were unable to participate and video clips were substituted for one station of the three stations. Students in those cycles rated the overall experience 4.5 with a range of 4.1-4.8. **Conclusion:** This integrated approach is highly acceptable to students. Video clip usage, live dyads, clear written objectives and use of a standardized tool preserve the interaction and immediacy of a clinical encounter while maintaining consistency in content. Although student comments express preference for live dyads, ratings of video experiences were also satisfactory.

Abstract 99

A Randomized Trial of Computer Attention Training in Children with Attention-Deficit/Hyperactivity Disorder

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Purpose: Parents, schools, and physicians have searched for an alternative and/or complement to medications for treating ADHD. We report preliminary results from a study in 17 schools that examines the efficacy of two computer-based attention training systems in teaching children with ADHD to concentrate more effectively. We compared a neurofeedback (EEG) computer system that teaches children to alter their brainwave activity with a standard computer format (SCF) system. We hypothesize that both treatments will result in improved school-based outcomes compared to a control condition. Methods: Forty-five children with ADHD in grades 2 and 4 were randomly assigned to receive the EEG, SCF, or a Waitlist Control condition (WLC). Children received forty 45-minute sessions three times a week at school for 4 months. Teachers completed the Swanson, Kotkin, Agler, M-Flynn and Pelham Rating Scale-Teacher Version (T-SKAMP) that assesses symptoms of ADHD in the classroom, while students completed the Permanent Product Measure of Performance (PERMP), a math test that analyses speed and accuracy. Double-blind classroom observations (Behavioral Observation of Students in Schools, BOSS) were conducted at three separate times for each student before and after the intervention. Results: Pre-post changes in the PERMP, T-SKAMP, and BOSS were analyzed. The EEG intervention group showed improvement on the PERMP math test ($p=0.03$), and a decrease in ADHD symptoms as reported by teachers on the T-SKAMP Attention scale ($p=0.01$). The SCF group showed improvement on the PERMP math test ($p=0.01$), and a trend towards decreased ADHD symptoms on the T-SKAMP. The WLC showed no significant effects on either the PERMP or the SKAMP. Effects on the BOSS followed similar trends but were not statistically significant. Conclusion: Preliminary results suggest that computer-based attention training programs offered in an elementary school setting may be effective in improving the performance of children with ADHD.

Abstract 100

Developmental Trajectories of Social Skills in Low Socioeconomic Status (SES) Infants and Toddlers

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Purpose: Social skills are important for educational achievement. There has been limited study of infant/toddler characteristics associated with later social competence in at-risk low SES children. Methods: Longitudinal analysis of mother-infant dyads followed from birth-36m as part of larger study. Inclusion criteria: English/Spanish language, no medical complications. Dependent variable: Social Skills (36m) - Behavior Assessment System for Children (BASC-2). Independent variables: Regularity (6m): Short Temperament Scale for Infants; Imitation/play (24m): Infant Toddler Social Emotional Assessment (ITSEA). Potential confounders (enrollment, 6, 14, 24m): child language development (PLS-4); cognitive stimulation in the home (StimQ); maternal depression (PHQ-9); sociodemographics. Results: 109 dyads included in analysis. Mothers: 32% HS grads; 94% Latina; 90% low SES. Infant regularity was associated with toddler imitation/play in both unadjusted analyses and multiple regression analyses adjusting for all potential confounders; both were associated with preschool social skills (see Table). In path analyses, the association between infant regularity and preschool social skills was mediated by toddler imitation/play, meeting Baron and Kenny criteria with bootstrap indirect effect .59 (95% CI .17, 1.1). Conclusion: The developmental trajectory of social skills for low SES preschool children is shaped by infant regularity and toddler imitation/play. Interventions to enhance social competence and long-term educational outcomes should address parent-child interactions in young infants and toddlers. Funding: NICHD (R01 HD047740), Tiger Foundation, Marks Family Foundation, Children of Bellevue, Inc., KiDS of NYU.

6m regularity, 24m imitation/play, and 36m social skills

	Imitation/play (24m)		Social skills (36m)	
	Unadjusted (r)	Adjusted (beta)	Unadjusted (r)	Adjusted (beta)

Regularity (6m)	.32**	.27**	.25*	.25*
Imitation/play (24m)			.33**	.33**

Abstract 101

Self-Reported Internalized Distress in 5-to-7 Year Old Chinese American and European American Children

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Purpose: The Berkeley Puppet Interview (BPI) assesses children's perception of their own symptomatology (Measelle, Ablow, Cowan, & Cowan, 1998). Studies have demonstrated the BPI as a reliable and valid assessment for young children in community and clinical settings (Ablow, et al., 1999). Psychometrically sound instruments are lacking for ethnic minorities, and especially more so with ethnic minority children. Thus far, studies conducted on Asian- and Chinese American adolescents suggest that they tend to experience higher levels of psychological distress compared to other ethnic groups (e.g. Zhou, Peverly, Xin, Huang, & Wang, 2003; Sue & Frank, 1973). The purpose of the study was to examine the internal consistency and mean differences of the internalizing scales of the BPI in Chinese American and European American children. Methods: Participants included 70 Chinese American (CA) and 52 European American (EA) children from the San Francisco Bay Area. Children were 5 to 7 years old (M = 6.35, SD = 0.81). Two dog puppets were used to interview children. After offering opposing statements about themselves, the puppets asked the child to provide a response pertaining to their own perception of themselves. Two coders coded on a 7-point Likert scale. In this study, only the internalizing subscales were examined. Higher BPI scores indicate greater levels of symptomatology. Results: The internal consistency of the CA group ranged from .55 to .65 (Depression \pm = 0.60; Overanxious \pm = 0.65; Separation Anxiety \pm = .61; Asocial With Peers \pm = .55; Social Inhibition \pm = .61). For the EA sample, the internal consistency ranged from .54 to .68. (Depression \pm = 0.68; Overanxious \pm = 0.54; Separation Anxiety \pm = .59; Asocial With Peers \pm = .56; Social Inhibition \pm = .66). An ANCOVA was conducted while controlling for age, gender, and SES. CA children reported greater levels Overanxiousness (CA=3.29 (.11); EA=2.94 (.10); F(1, 141)=4.95, p<.05), and Separation Anxiety (CA=3.53 (.12); EA=2.88 (.11); F(1, 141)=14.35, p<.001), than EA children. Conclusion: The alpha values are consistent with previous studies that have used these scales in community samples and considered acceptable for child report (Ablow et al., 1999; Measelle et al., 1998). CA children tended to report greater distress than EA children, which parallel findings among older children and young adults.

Abstract 102

Early Adolescent Drug Use: Longitudinal Analysis of Cognition, Impulsivity and Problem Behaviors

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Purpose: Many longitudinal studies have examined patterns of risk behavior in children with developmental delay, conduct disorder, and troubled family environments. Fewer studies have examined patterns of actual engagement in risk behaviors in community samples of youth prior to peak ages of risk for drug use. We examined drug use in youth at four annual assessments to determine if drug-using subjects (DU) can be differentiated from non-drug users (NU) in NC function, impulsivity, problem behaviors and non-drug risk taking. Methods: Youth ages 10-12 y

(n=387) of mixed SES were enrolled from Philadelphia schools. Annual evaluations included: self reported risk behaviors, e.g., fighting, sexual activity; 2) NC functioning ; 3) Impulsivity (IMP); and 4) problem behaviors (YSR)). For this report, DU (n=58) were defined as those reporting drug use at each of three annual assessments; NU (n=172) reported no drug use at any assessment. Participants not included reported other drug use patterns across assessments. Results: The most frequently used drugs by DU were alcohol (78%), cigarettes (34%), marijuana (22%), and inhalants (9%). DU were older than NU at project initiation (11.70.9 vs.11.2 0.8, $p<.001$), more likely male (59% vs. 41%; $p=.022$), and of lower SES than NU, $p=.015$. Using GEE, we examined effects of group (DU, NU), age at testing, gender, and time on NC, IMP, problem behavior and non-drug risk taking. DU had higher IMP, $p.017$, problem behaviors (Internalizing, Externalizing, and Total Problem scores) than NU at all time points, $p<.001$, and exhibited higher non-drug risk taking than NU, $p<.001$. After adjustment for multiple comparisons, DU and NU were similar in NC function, with scores for both improving over time. There were no group by time interactions. Conclusion: At an early age DU youth differ from NU in IMP, problem behaviors and non-drug risk taking, but not NC function. These results suggest that strategies for prevention of DU should address issues of impulsivity and problem behavior rather than cognitive function.

Abstract 103

The Relation of Paternal Depressive Symptoms and Infant Negative Affect

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Purpose: Paternal depression has been linked to long-lasting effects on children's well-being across childhood but little is known about its relation to infant affective development. This study evaluated the individual and combined contribution of paternal and maternal depressive symptomatology to infants' negative affect observed during naturalistic home observations. We expected to find an independent relation between paternal depression and infant negative affect and an interaction of paternal and maternal depression to infant negative affect. Methods: 68 low-risk European-American mother-father-infant triads participated. At 3 months postpartum, mother-infant everyday activities were videotaped for 30 minutes at home; fathers were not present. Each parent completed the Center for Epidemiological Studies-Depression Scale (CES-D). Parents were classified into three symptom groups: low (0-1); normative (2-15); or high (16). Coders blind to parental symptomatology coded infants' displays of negative affect (negative facial expressions, vocalizations) from videotaped interactions. A stepwise regression model evaluated (1) the association between level of paternal and maternal depressive symptoms and the percentage of time infants displayed negative affect, and (2) the interaction effects of maternal and paternal depression on infant negative affect. Results: Contrary to our expectation neither paternal symptomatology ($R^2=.065$, $F(2,66)=2.259$, $p=0.113$) nor the interaction between maternal and paternal symptomatology ($R^2=.047$, $F(3,64)=1.608$, $p=0.208$) were related to infants' negative affect. Consistent with previous findings, infants of high symptom mothers exhibited more infant negative affect ($R^2=.063$, $F(2,66)=4.414$, $p<0.05$). Conclusion: Given the relation of paternal depression to children's development, the lack of relation of paternal depressive symptoms to infants' negative affect and the lack of an indirect effect via the mother are surprising, and require further exploration.

Abstract 104

How Do Screening Tests Perform in Settings Serving At-risk Populations?

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Purpose: Quality screens are standardized on a sample of children and families whose socio-economic and demographic characteristics represent those of an entire nation (e.g., in the US by creating a normative group that reflects Census Bureau population parameters). Standardization of tests on such a sample defines what is typical performance and, in the case of screening tests, predicted frequencies of referral rates. Should researchers and clinicians working with Medicaid, NICU follow-up, or other at-risk groups expect their referral rates to differ from national norms? Methods: Referral rates based on national norms for *Parents Evaluation of Developmental Status (PEDS)* (N = 771) were compared to those from a pediatric clinic serving mostly Medicaid patients in Milwaukee, Wisconsin (N = 744), and to 211LA, a warm line serving mostly ethnic minority families (47% Latino and 30% African-American) in non-medical crisis (e.g., housing or food instability)(N = 257). Results: Chi-square comparisons among the three groups revealed that clinics serving families with elevated rates of psychosocial risk (e.g., poverty, less than a high school education, limited English proficiency, etc.) had significantly higher rates of children with problematic performance on PEDS ($p < .0001$). These results are corroborated by other studies of at-risk samples who were administered different screening tests. Conclusion: The impact of psychosocial risk on development is well known to developmental-behavioral specialists. Helping trainees and generalist pediatricians anticipate increased referral rates when working with at-risk populations is needed. Screening test authors should help by reporting, not only the frequency of problematic performance on nationally representative samples, but also frequencies for various at-risk populations (e.g., children in foster-care, NICU follow-up, etc.).

Abstract 105

Core White Matter Characteristics Related to Behavioral Problems in 9-16 Year Old Preterm and Full-term Children

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Purpose: Preterm children have more behavior problems, including inattention and anxiety symptoms, than full-term peers. To date, the only study on behavior, white matter (WM) microstructure, and prematurity found areas of abnormal WM, e.g. internal and external capsules and long fascicles, in 15-year-old preterms were related to inattention, social deficits, and overall mental health, but not specifically to anxiety or hyperactivity (Skranes et al., 2007). Methods: Preterms (n=19, mean age 11.9 yr) and full-term controls (n=15, mean age 13.4 yr) were assessed on the CBCL, a standardized behavior rating scale. Outcomes were t scores for anxiety (Anx), social (Soc), attention (Att), and Externalizing (EXT, rule-breaking and aggressive behavior) problems. DTI data were pre-processed with FSL Diffusion Toolbox. Tract-Based Spatial Statistics, based on fractional anisotropy (FA), defined the centers of major WM tracts throughout the brain. We evaluated correlations between FA of tract centers and behavior symptom scores. We set $p < .05$ after correction for multiple comparisons. Results: Preterm and control groups did not differ in FA in the centers of major WM tracts; however, behavior scores correlated with FA. More Anx ($p < .01$), Att ($p < .01$), EXT ($p < .05$), and Soc ($p < .07$) problems were associated with lower core FA in multiple tracts. Tracts correlated with Anx included corpus callosum (CC), left (L) superior longitudinal fasciculus (SLF), inferior fronto-occipital fasciculus (IFO), inferior longitudinal fasciculus (ILF), posterior limb of internal capsule (PLIC), right (R) external capsule (EC), cingulum (CNG), corona radiata (CR), and cerebral peduncle (CP). Tracts correlated with Att overlapped in CC, L SLF, IFO, ILF, L PLIC, CNG, CR, and CP; but also included R SLF, L anterior limb of IC (ALIC), and L EC. Tracts correlated with EXT overlapped in CC, L SLF, IFO, ILF, and CR; but included L ALIC and L EC, similar to Att. Tracts correlating with Soc included CC, L SLF, L IFO, L ILF, and CR. Conclusion: Compared to a previous study, we found additional links between anxiety and externalizing problems and core WM microstructure. We replicated

findings for attention and social problems even when preterms as a group had no obvious WM damage compared to full-terms. Our study found significant associations using a more conservative WM analysis method while including a wider age range of children.

Abstract 106

Effects of Behavioral Parent Training on Injury Risk Behaviors in Children

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Purpose: Unintentional injury is the single largest cause of death among children in the U.S., resulting in more deaths than all other diseases combined. Children with externalizing behavior problems are at increased risk for injury. In addition to controlling access to hazards and modifying the environment as means to decrease injury, data show children are less likely to be injured when parents more closely and actively supervise their children. The present study evaluated the effectiveness of Triple P (Positive Parenting Program), an empirically-supported behavioral parent training program, for decreasing injury risk among 3-7 year-old children. Methods: Participants were 20 parents referred by primary care pediatricians in and around a Midwestern city due to their child's externalizing behavior problems. Information regarding child injury risk and externalizing behavior problems was collected from parents before Triple P (Time 1), at the conclusion of Triple P (Time 2) and 8-weeks following Triple P (Time 3) using the Injury Behavior Checklist, and the Eyberg Child Behavior Inventory. Results: A paired sample T-test revealed significant decreases in injury risk behaviors from Time 1(M=21.72, SD=12.30) to Time 2(M=15.72, SD=8.59), $t(17)=2.28, p<.05$. Further analysis indicated these results were maintained at Time 3(M=14.36, SD=10.70), $t(10)=2.71, p<.05$. Additional analyses found significant decreases in externalizing behavior problems from Time 1(M=148.00, SD=22.77) to Time 2(M=119.83, SD=26.00), $t(17)=4.39, p<.05$, with a similar pattern maintained at Time 3 (M=115.55, SD=21.66), $t(10)=5.73, p<.05$. Changes in externalizing behaviors ($r^2=-.22$, ns) did not account for changes in injury risk. Conclusion: Preliminary results indicated child injury risk behaviors and externalizing behaviors decreased over time for families who participated in a behavioral parent training program. The present findings suggest parenting practices around risk behaviors may have had reduced injury risk, not changes in child behavior alone. The present findings support the utility of parent training to decrease injury risk in children with externalizing behavior problems.

****Abstracts 22, 25, 31, 32, 35, 37, 39, 41, 46, 55, 67, 68, 70, 72, 73, 77, 82, 83, 86, 87, 90, 94 and 107 were previously published research and are not included in this online publication.***