Best MCOM Med II Student Poster Presentation: Clinical Sciences

Compatibility of Heparin with Ethanol for Ethanol-Lock Therapy of Central Venous Catheters

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Keywords: Ethanol, Heparin, Ethanol-Lock Therapy, Central Venous Catheters, Central Line Infection

Objective: Central venous catheter-related bloodstream infections are the most common preventable infections in contemporary cancer care. Administration of ethanol directly into central venous catheters has shown promise for prevention of such infections, but has been associated in clinical trials with the development of thrombosis and catheter occlusion. Common anticoagulants such as heparin are not thought to be compatible with ethanol. We hypothesized that at low concentrations, heparin will be compatible in solution for co-administration with ethanol.

Methods: Heparin at concentrations from 0-100 units/mL was incubated overnight in 30%, 50%, or 70% ethanol, at temperatures ranging from 4-40 °C. Precipitate formation was assayed in nephelometric turbidity units (NTU’s) using a benchtop turbidimeter. Each concentration and temperature condition was replicated 6 times, with means compared by ANOVA with post-hoc T-test (p<0.05).

Results: Precipitate formation in NTU’s for heparin incubated overnight in 70% ethanol at 37 °C was 0.05 ± 0.02 for 0 units/mL heparin, 0.19 ± 0.01 for 1 unit/mL, 4.27 ± 0.01 for 10 units/mL, and 467.83 ± 11.74 for 100 units/mL (p<0.05 for 100 units/mL versus all other concentrations). There was no significant precipitation for any heparin concentration below 100 units/mL in ethanol. This held true at all ethanol concentrations tested, and at all temperature conditions.

Conclusion: Heparin at 1 unit/mL or 10 units/mL does not meaningfully precipitate with ethanol and should be evaluated in clinical trials for co-administration with ethanol. However, heparin at 100 units/mL (used by many medical centers in mediports and hemodialysis catheters) is incompatible for administration to patients with ethanol, owing to dense precipitation.

Research supported by: American Heart Association Medical Student Fellowship Grant

Best MCOMC Med II Student Poster Presentation: Evidence-Based Research

Gender Related Differences in Glucocorticoid Therapy and Growth Outcomes among Pubertal Children with 21-Hydroxylase Deficiency Congenital Adrenal Hyperplasia

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Keywords: CAH, gender, puberty, hydrocortisone dose, chart review

Objective: The purpose of this study is to determine if glucocorticoid dosage differences exist among pubertal males and females with 21-hydroxylase deficiency congenital adrenal hyperplasia (CAH) at various Tanner stages of puberty.

Methods: This was a retrospective chart review study at an academic Pediatric Endocrinology office in Tampa Bay, Florida. Between January 1981 and May 2011, 867 patients were evaluated for precocious puberty or CAH. Of these charts, twenty females and seventeen males were diagnosed with 21-hydroxylase deficiency simple virilizing CAH and followed through all stages of pubertal development.

Results: Males received a higher hydrocortisone dosage than females throughout all stages of pubertal development. Males received an average dose of 16.4±4.8 mg/m2/day of hydrocortisone whereas
females received an average dose of 13.7±4.6 mg/m2/day. No significant difference in glucocorticoid dosage was found at Tanner stage 1 or 2; however, the glucocorticoid dosage in males was significantly higher than in females at Tanner stages 3-5 (p < 0.05). Higher doses were associated with a shorter predicted adult height. The majority of adolescents with CAH were on average 9.6 cm shorter than their mid-parental height.

**Conclusion:** At all Tanner stages of puberty, glucocorticoid dosage differences did exist between males and female with CAH. It is important to determine an optimal glucocorticoid dose for adolescents, as increasing dosages were negatively correlated with adult stature. A prospective study, carefully measuring compliance and ensuring appointment follow-up, would be beneficial to determine the ideal hydrocortisone dose for adolescents with CAH.

**Research supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine

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**Best Undergraduate Poster Presentation: Interdisciplinary**

**Effects of Early Initiation of ART on Neopterin Levels in HIV-infected Adolescents**

Erik Richardson, Susan Lukas MPH, Bret J Rudy MD, and John W Sleasman MD
University of South Florida Morsani College of Medicine

**Keywords:** HIV, Neopterin, macrophage activation, antiretroviral therapy, ART

**Objective:** HIV pathogenesis is primarily the result of CD4 T cell attrition but macrophage activation also plays an important role in disease progression and may not be reversed by antiretroviral therapy (ART). Neopterin is a low-molecular protein derived from activated macrophages and can be measured in plasma as a marker of macrophage activation. We sought to determine if initiation of early ART, prior to CD4 T cell decline, has an impact on neopterin levels in HIV-infected youth. Our hypothesis is that early use of ART lowers macrophage activation.

**Methods:** A cohort of HIV-infected youth (aged 18 – 25) were enrolled in a study to examine the impact of early ART on immune activation. Subjects were randomized (3:1) to Group 1: initiating early ART (CD4>350 cells/ul) or to Group 2: initiating ART according to DHHS guidelines (CD4<350 cells/ul). Healthy controls balanced for age, gender, and ethnicity were recruited.

Plasma neopterin levels at three time points: entry, 24 weeks, and 48 weeks were measured using ELISA.

**Results:** Group 1 achieved viral loads of <200 copies/ml by 48 weeks on ART. Group 2 had stable CD4 T cell counts and remained off ART. Neopterin levels decreased significantly in group 1 from 11.94 ng/ml pre-therapy to 6.560 ng/ml after 48 weeks, (p<0.0001), similar to controls 7.543 ng/ml. However, neopterin levels in Group 2 remained elevated at 48 weeks, 10.68 ng/ml at entry, and 10.24 ng/ml after 48 weeks.

**Conclusion:** Using neopterin as a biomarker, early ART lowers macrophage activation to normal levels by 48 weeks on treatment. By lowering macrophage activation, early ART is likely to minimize the disease complications associated with macrophage activation such as cardiovascular disease and HIV-associated neurocognitive decline.

**Research supported by:** RFA-DA-10-014

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**Best College of Public Health Poster Presentation: Graduate Student**

**Postpartum Depression Screening: Are Pediatricians on Board?**

Courtney Judd, MD - University of South Florida, Sharon Dabrow, MD - University of South Florida, College of Public Health, Dept. of Community & Family Health

**Keywords:** postpartum depression, screening, pediatric

**Objective:** The purpose of this study is to determine the prevalence of postpartum depression (PPD) screening among outpatient pediatric primary care providers in Florida.

**Methods:** A 15 item multiple choice survey was sent by electronic mail to Florida AAP members and Florida pediatric residency programs. Eligible respondents were primary care physicians who provide outpatient care for infants 6 months of age or younger. Survey questions elicited information about the frequency and style of PPD screening, appointment types during which screening occurs, action taken for concerning screening results, and provider awareness of suggested PPD screening practices.

**Results:** Out of 71 total respondents, 65 were eligible to complete the survey. Of those, 92.1% reported ever discussing PPD with parents. Only 47.6% of providers have ever used a formal PPD screening scale, with 63.3% of them reporting use of the Edinburgh Postnatal Depression Scale and 30% reporting use of the Postpartum Depression Screening Scale. The highest use of PPD screening scales occurs during the 1-2 week (70%), 1 month (60%), and 2 month (63.3%) well visits. Use of PPD screening tools drops after 2 months, with 16.7% of physicians using them at 4 month visits and 10% at 6 month visits. Less than half (42.9%) of providers are aware of any AAP suggestions regarding PPD screening.
Conclusion: This study of Florida pediatric providers reveals that less than half of physicians are consistently using a PPD screening tool, and few are screening mothers after the infant's 2 month check-up. Awareness and knowledge regarding AAP recommendations are low. Future efforts directed at improving pediatric provider knowledge may help to promote routine PPD screening and thus ensure healthy environments for children.

An Unconventional Look at Microbial Dysbiosis in the Gut
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Keywords: Gut Microbial Immune Dynamics, Dysbiosis, Homeostasis, Ciona intestinalis

Objective: We are studying gut microbial immune dynamics (GMID) in a marine invertebrate chordate, Ciona intestinalis. While Ciona is a seemingly simple organism it filters microbial-rich seawater yet its gut is inhabited by distinct microbes. It is becoming increasingly clear in medicine that gut-microbial homeostasis has prognostic value in both health and disease etiologies.

Methods: Compositional changes in gut microbiota are studied with 16s libraries, 16s RFLP, and real-time PCR. We are disrupting microbial colonization during development and monitoring the effects on gut anatomy and on innate immune sensors. Bacterial lysates and other commercial preparations (MAMPS; e.g., LPS) are used to monitor the effects of inflammation on microbial colonization and stability.

Results: Gut bacteria from several populations have been partially sampled using molecular approaches. The Ciona gut reveals distinct communities of bacteria that are affected by both diet and environment. Starvation induces reproducible dysbiosis and reveals conserved bacterial types. Innate immune proteins such as the secretory immunoglobulin receptor, VCBP, can be unregulated by overwhelming the gut with MAMPSs.

Conclusion: Colonization of the gut occurs almost immediately after birth and involves highly sophisticated ecological events. However, colonization is not random, and early colonizers can become long-term inhabitants resulting in life-long mutualisms. Key signals in the onset of IBD-like symptomology in mammals involves primary innate phenomena which can be more easily studied in the absence of adaptive immunity and it's associated complexities. Ciona offers a unique opportunity to study the molecular events surrounding gut microbial homeostasis.

Subcutaneous Hizentra® (20%) is Better Tolerated and Shares Similar Efficacy Compared to Subcutaneous Vivaglobin® (16%).
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Keywords: Subcutaneous Immunoglobulin, Efficacy, Tolerability, Hizentra

Objective: Replacement Subcutaneous IgG (SCIG) therapy is effective treatment in reducing rates of infections in patients with primary immunodeficiency diseases (PIDD), but there are few comparative studies using different SCIG preparations. This study examines the tolerability and efficacy of Hizentra (20%) subcutaneous immune globulin (SCIG) product compared to Vivaglobin (16%).

Methods: A prospective, single-center, open-label cohort of 32 PIDD subjects, who received 16% Vivaglobin for at least 6 months and transitioned to 20% Hizentra for 24 weeks. Number of acute serious bacterial infections (aSBI) and overall tolerability on Vivaglobin was assessed for 8 weeks prior to switch and compared to Hizentra over 24 weeks. Average Hizentra dose was higher than Vivaglobin at 161.6 +/- 99.8 and 145.9 +/- 88.2 mg/kg/week, respectively (p < 0.0001).

Results: The study is ongoing and preliminary findings for all subjects through 12 weeks on Hizentra are reported. aSBI/subject/year while receiving Vivaglobin was 0.2 compared to 0.14 on Hizentra. Per-person annual rates of other infections were lower for Vivaglobin at 1.2 versus 2.63 for Hizentra (p = 0.0167). There were no infusion-related serious adverse events in either group. Average infusion time decreased from 108 minutes (3.2 sites) with Vivaglobin to 72 minutes (2.1 sites) with Hizentra. Mean Vivaglobin IgG were similar to Hizentra, 1096.1 (+/- 231.2) and 1105.2 (+/- 233.3) mg/dL, respectively (p =0.77). Both groups had similar titers to varicella (103.1 versus 107.9 EU/mL) and tetanus (2.8 versus 2.9 IU/mL) on Vivaglobin and Hizentra, respectively.
Conclusion: Hizentra (20%) achieves better tolerability and similar efficacy to Vivaglobin (16%).

Research supported by: This is an investigator initiated study with grant from CSL Behring.

**Soluble Immune Activation Markers and the Early Initiation of ART in HIV–Infected Adolescents.**

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**Keywords:** HIV, sCD14, sCD27, immune activation, ART

**Objective:** Clinical management of HIV-infected adolescents is dependent on reducing viral load and reducing chronic immune activation. ART decreases the viral load; however the effect of the timing of initiation of therapy on immune activation biomarkers in HIV (+) adolescents is unknown. Soluble CD27 (sCD27) and soluble CD14 (sCD14) are measurable markers of chronic inflammation that are multifactor in their effector nature. We propose to investigate effect of early initiation ART on overall immune activation in HIV (+) adolescents as measured by plasma sCD27 and sCD14 levels.

**Methods:** HIV (+) adolescents having CD4+ T-cell counts > 350 cells/μl were recruited into a study and randomized in a 3:1 manner into the experimental arm, initiating ART at entry, and a standard of care arm (SOC), initiating ART when CD4 < 350 cells/μl. A healthy donor cohort that was age, gender and ethnicity balanced to the study arms was recruited to serve as controls. Plasma sCD27 and sCD14 levels were measured by ELISA.

**Results:** sCD27 and sCD14 levels in both the experimental and the SOC arms were increased compared to the healthy control (p<.0001). Initiation of ART did not significantly reduce sCD27 and sCD14 levels at 48 weeks when compared to the SOC arm. sCD27 levels correlated positively with sCD14 levels. (r=,4665, p=.0036)

**Conclusion:** Initiation of ART did not reduce sCD27 and sCD14 levels in the experimental arm of the study. The positive correlation between sCD27 and sCD14 suggests that multiple routes of immune activation are present. These findings indicate that immune activation remains elevated despite a reduction in viral load in HIV+ patients initiating early ART with CD4+ T cell counts >350 cells/mm3.

Research supported by: This research was supported by the Research Scholarly Concentration at USF Health, Morsani College of Medicineand RFADA10014.

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**Subcutaneous Vivaglobin® Replacement Therapy in Patients with Humoral Immunodeficiency Confers Protective Antibody Titers to Major Organisms**

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**Keywords:** Subcutaneous Immunoglobulin, Vivaglobin, tetanus, varicella, pneumococcal titers

**Objective:** Patients with humoral immune deficiency receiving subcutaneous immunoglobulin (SCIG) are presumed to receive protective passive antibody against a variety of pathogens. The goal of this study is to determine if their steady state plasma titers to tetanus, varicella and Streptococcus pneumoniae are maintained in protective range while on SCIG®.

**Methods:** A cohort of 34 subjects [XLA/ARAG (n=4), HIGM (n=2), SCID post BMT (n=1), CVID (n=12), SAD (n=14),THI (n=1)] receiving SCIG in the form of Vivaglobin® for at least 6 months were examined at 2 times points obtained 8 weeks apart. Plasma total IgG and specific IgG to varicella, tetanus and Streptococcus pneumoniae were measured during steady state by standard methods.

**Results:** Mean IgG level at diagnosis was 386.2 mg/dL (33 – 877,±223.5). Mean IgG at steady state is 1103.3 mg/dL (490 – 1680, ± 237.8). Average Vivaglobin® dose is 153.8 mg/kg/week (37.6 – 528.4, ±94.7). All subjects have protective tetanus and varicella titers with average tetanus titer of 2.7 IU/mL (0.6 – 6.9, ±1.2) and varicella titers of 101.9 Eu/mL (41 – 315, ± 38.85). Eight out of 14 pneumococcal serotypes (or 57%) have average protective titer defined as greater than 1.3 mcg/mL. Pneumococcal serotype 14 has an average highest titer of 8.8 mcg/mL (0.1 – 112.1, ± 15.8) with over 96.9% of subjects having protective titers. Pneumococcal serotype 12F has the lowest titer of 0.4 mcg/mL (0.3 – 1.2, ± 0.3) and none of the studied subjects have protective titers to this serotype.
Conclusion: Subjects with primary immune deficiency who receive subcutaneous Vivaglobin® and maintain average steady state IgG level above 1000 mg/dL have protective titers to tetanus, varicella and 8 out of 14 Streptococcus pneumoniae serotypes.

Research supported by: CSL Berhing Grant.

A Case Of Multiple Simultaneous Urticarial Syndromes Refractory to Treatment Jim Parkerson DOa, John Sleasman MDb, Dennis Ledford MDa a = University of South Florida Department of Internal Medicine, Division of Allergy and Immunology. b = University of South Florida Department of Pediatrics, Division of Allergy and Immunology,University of South Florida ,Morsani College of Medicine, Dept. of Internal Medicine Keywords: urticaria, physcial urticaria Objective: To report the case of a patient with three forms of physical urticaria and his response to treatment. Methods: An atopic, asthmatic 11 year old male who since the age of five has experienced small, raised, red, pinpoint pruritic “bumps” over his entire body except the palms of his hands and soles of his feet. Exercise, stress, cold air, and cold water immersion trigger an outbreak of the hives. Antihistamines have not controlled his symptoms up to this time. Results: The patient was diagnosed with cold urticaria, cholinergic urticaria, and dermatographism. The patient was instructed to double the antihistamine and return to the clinic in four weeks. Upon re-evaluation, the time to develop hives upon exposure to his known triggers increased by about 15-20% or about five minutes. The patient and his family were frustrated that he was not “cured.” The patient was started on omalizumab therapy for difficult to control asthma but it was discontinued due to side effects. Conclusion: Cases with multiple forms of urticaria are rare but are not unprecedented. Physical tests are vital to determine which forms of urticaria are present. In this case, an ice cube test confirmed the presence of cold urticaria and the negative hot test tube test eliminated a diagnosis of heat urticaria. Mixed forms of urticaria are more challenging to treat. This patient failed a combination of cyprohepatadine and hydroxyzine which has been reported to be successful in previous case reports. The patient started omalizumab therapy for difficult to control asthma but had side effects with the first two injections and the omalizumab was discontinued. Treatment with a immunomodulators such as dapsone or tacrolimus are being considered for his difficult to control urticaria.

What Reasons do Adolescents Give for Presenting to the Emergency Department over their Primary Care Provider?

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Keywords: Emergency Medicine Adolescent Medicine

Objective: Emergency departments (EDs) across the United States are burdened by over-crowding and non-urgent visits. No recent studies have examined the reasons why adolescents present to the ED rather than to their primary care provider (PCP) with a non-urgent complaint. This study aimed to characterize the population of adolescents presenting to a large, high-volume, urban children’s hospital ED and to examine the reasons given for presenting to the ED rather than to the PCP’s office.

Methods: ED patients aged 12-21 years were invited to participate. A 21-item, online survey was administered assessing the main reason for presentation to the ED, key characteristics of the PCP’s practice, and the adolescent’s relationship with the PCP.

Results: Of the 203 participants, 60% were female and 80% were African American. The median age was 15 years (S.D. 2.37 years). Sixty-six percent (n=134) had public insurance, 93% (n=189) identified a primary doctor or clinic, and 40% were triaged as non-urgent. The most common reasons for presenting to the ED instead of to the PCP were: perceived illness requiring immediate care (34%, n=70), and PCP instructions to go to the ED (21%, n=42). Adolescents with private insurance were significantly more likely (p<0.0001) to be triaged as urgent compared to those with public insurance.

Conclusion: Almost all adolescents in this study were able to identify a PCP or primary clinic. Nonetheless, they frequently perceived that they were too ill to wait to see their PCP or reported being
Assessment of Repeated Measures of Fractional Exhaled Nitric Oxide in Clinically Stable Persistent Asthma

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Keywords: Fractional exhaled nitric oxide, asthma

Objective: The recent American Thoracic Society guidelines on interpretation of fractional exhaled nitric oxide (FENO) levels suggest monitoring changes in children with asthma. The goal of this study was to determine if changes in FENO levels are observed in children with persistent asthma during clinical stability to determine the need for repeated FENO levels once baseline values are established.

Methods: This is a prospective control cohort study of clinically stable asthmatic children (n=54) aged 4 to 18, followed in the allergy and immunology division. Patients were assessed at two visits six months apart. FENO (Aerocrine, Sweden) and spirometry (Koko Pneumotach) were conducted and clinical history was obtained at each visit. Controls (n=12) were healthy with no history of atopy or asthma. Statistical analysis was performed using Prism (Graphpad Software, California).

Results: Significant difference in FENO (p=0.02, Mann-Whitney U 57.5) was observed between the asthma (28.3 ppb+/− 4.59) and control group (9.4 ppb+/−1.42). We found no significant change in FENO values between visits (p=0.78, Mann-Whitney U 153, 22.98 ppb+/−5.24 on initial measurement and 24.66 ppb+/−5.77 on follow up). Two subgroups were identified in the asthma group, subjects with elevated FENO (54.73 ppb+/−6.38) and those with levels comparable to controls (11.66 ppb+/−1.36). There was no significant difference on follow up levels in each of these two subgroups (p>0.05).

Conclusion: FENO measurements remain unchanged in children with clinically stable persistent asthma suggesting FENO levels should be repeated based on changes in clinical symptoms.

Research supported by: Health Resources and Services Administration, Department of Human Services, All Children’s Hospital. HRSA IC76HF00920-01.

Regulation of Antioxidant Responses in Prostate Cancer: Effects of Lycopene

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Keywords: Reactive oxygen species, Antioxidant, Prostate cancer, Lycopene

Objective: Reactive oxygen species (ROS) can be mutagenic and may promote cancer. Evidence from epidemiological, experimental studies and clinical trials suggests that lycopene may modify risk or delay progression of prostate cancer. However, the molecular mechanisms involved are still unclear. The aim of this study is to determine the effects of lycopene on endogenous ROS and antioxidant responses in normal prostatic epithelial cells and in prostate cancer cells.

Methods: Endogenous ROS was measured with DCFH-DA, glutathione (GSH) cycling was assayed using a luminometric technique; Nrf2 signaling was measured using PCR, western blotting, and nuclear translocation assays; Nrf2-dependent activation of the antioxidant response element (ARE) was assayed by gene reporter assays.

Results: ROS levels were much higher in prostate cancer cell lines than in normal prostate cells (PrEC). Lycopene reduced ROS levels in a dose-dependent manner in androgen-dependent LNCaP, but not in androgen- independent DU145 or PC3 cells. Intracellular levels of reduced GSH differs in cancer cells with highest in DU145 and were associated with abundant Nrf2 levels. Lycopene treatment did not significantly affect cell GSH or nuclear translocation of Nrf2 in either normal or prostate cancer cell lines. Using a cell-based ARE-reporter assay, we found that lycopene treatment increased ARE transcriptional activity in LNCaP, but decreased ARE activity in DU145 cells.

Conclusion: These findings indicate that lycopene may impair the PC cell survival machinery through regulating intracellular ROS and the antioxidant response. Certain effects appear to be independent of Nrf2 signaling.
**Antiretroviral Therapy (ARV) Fails To Correct B Cell Activation in Both Behaviorally-Acquired (BAH) and Perinatally-Acquired HIV-Infected (PAH) Cohorts**

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**Keywords:** HIV, B cells, ART, flow cytometry, immune activation

**Objective:** HIV is characterized by B cell dysfunction leading to impaired antibody responses. We sought to compare B cell subpopulations among adolescents with BAH infection before and after initiation of ART, adolescents with PAH on therapy, and healthy adolescents. Increased percentages of CD21-/low and CD80/86 B cells were used as indicators of B cell activation.

**Methods:** Using fresh whole blood samples, multiple parameter flow cytometry analysis enumerated CD19/CD27 with extended markers including surface IgM/IgD, CD21, CD23, CD80 and CD86 in 44 healthy controls (HC), 38 BAH subjects with normal CD4 counts (>350) before and 48 weeks after initiation of ART, and 21 PAH subjects.

**Results:** There were no differences in total CD19+ B cell percentages among the groups. Prior to ART, CSR (class-switch recombination) in CD27+ memory B cells was lower in BAH compared to HC (p<0.01), but corrected with ART. In contrast, B cell activation marker CD21-/lo remained elevated in both BAH and PAH following ART (p<0.001 and p<0.01, respectively). However, activation markers CD80/86 normalized in BAH but remained elevated in treated PAH (p<0.001).

**Conclusion:** ART corrects defects in memory B cell maturation but B cell activation remains high in spite of low viral levels, suggesting ongoing immune activation independent of viral replication.

**Research supported by:** R01AI407723 ATN061-U01 HD040533

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**Cognitive-Behavioral Treatment for Anxiety Disorders in Children with Autism Spectrum Disorders**

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**Keywords:** anxiety, autism, child, treatment, CBT

**Objective:** Autism spectrum disorders affect as many as 1 out of 91 children (Centers for Disease Control, 2007). Comorbid psychological disorders, especially anxiety (Bellini, 2004), are common in the ASD population (Simonoff et al., 2008). This may cause additional distress and impairment beyond the ASD diagnosis. The linguistic, cognitive, and social characteristics of ASD may render standard treatment approaches (developed for otherwise typically developing youth) for anxiety less effective for children with ASD (Volkmar & Klin, 2000). Thus, a clinical need remains for the modification of existing treatment modalities for this unique group. Accordingly, we report on a randomized controlled trial examining the efficacy of CBT relative to treatment as usual (TAU) in 44 youth ages 7-11 with ASD and comorbid anxiety disorder(s).

**Methods:** Forty-four children (ages 7-11) with ASD and comorbid anxiety disorder(s) were randomly assigned to 1 of 2 treatment conditions. The cognitive behavioral therapy condition (CBT) involved participants receiving immediate treatment for 16 weeks. The treatment as usual condition (TAU) delayed treatment for 16 weeks. But, during this period, participants could seek treatment outside of the study. An independent evaluator assessed primary outcome measures which included change in anxiety symptom severity; response rates; and remission rates.

**Results:** Those in the CBT condition experienced higher response rates to treatment than those children in the TAU condition. Relative to the TAU arm, the CBT arm was associated with significantly greater reductions in anxiety symptomology.

**Conclusion:** These data provide additional support for the efficacy of CBT in treating anxiety symptoms among youth with ASD.

**Research supported by:** All Children's Hospital Foundation.
**Better Golden Hour Care Significantly Improves Outcomes for Extremely Low Birth Weight Infants**

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**Keywords:** Golden Hour Low birth weight Quality Improvement

**Objective:** There is evidence that care provided to extremely low birth weight (ELBW) infants during the first "golden hour" of life can significantly affect outcomes. However, there are few published reports of process implementation and associated improvements in outcomes. We describe the implementation and evaluation of an evidence-based "golden hour" pathway for the care of infants born at ≤ 28 weeks gestational age or with birth weight ≤ 1000 gm.

**Methods:** We initiated a quality improvement project to determine if a standardized pathway for the management of ELBW infants during the first hour of life would improve the efficiency of care delivery, and improve outcomes. Data were collected prospectively for all infants delivered with an estimated gestational age <28 wks or birth weight < 1 kg. We compared our prospective data with those from admissions that met golden hour criteria during the two years prior to implementation of the pathway.

**Results:** 122 ELBW infants were treated according to the "golden hour" pathway, and their data were compared with those from 173 infants treated before pathway implementation. Improvements were achieved in the time from birth to surfactant administration, body temperature on admission to NICU, and time from admission to dextrose and amino acid infusion. Infants treated under the golden hour protocol had a 64% reduction in the odds of developing chronic lung disease (OR=0.36; 95% CI 0.17, 0.74), p=0.005 and a 48% reduction in the odds of developing retinopathy of prematurity (OR = 0.52, 95% CI 0.28-0.98), p= 0.043.

**Conclusion:** A standardized, evidence-based approach to the management of the ELBW infant during the “golden” first hour of life can result in more efficient care delivery and can significantly improve outcomes.

**Mediators of Functional Impairment in Adult Obsessive-Compulsive Disorder**

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**Keywords:** OCD, mediators, adults, impairment,

**Objective:** Obsessive-compulsive disorder (OCD) is a chronic and often disabling illness with an estimated prevalence of 1-2%. OCD is associated with social, occupational, and familial impairment. To date, little research has systematically examined factors that predict OCD-related disability. The available research, however, has produced two consistent findings. First, more severe OCD symptoms and greater difficulty resisting and controlling obsessions and compulsions, appear to strongly predict higher levels of functional disability. Second, depressive and anxious symptoms, which often co-occur with OCD, were positively associated with poorer functioning. However, little research has examined the factors that contribute to OCD-related disability over and above symptom severity. The main goal of the present study is to investigate factors that mediate the relationship between illness severity and OCD-related disability. The factors examined include symptoms of depression and anxiety, sensitivity to anxiety, and ability to control symptoms.

**Methods:** Participants (N=47) were adults aged 18 years or older. A clinician administered two measures of obsessive-compulsive severity and participants completed several questionnaires that assessed depressive and anxiety symptoms, sensitivity to anxiety, ability to control OCD symptoms, and level of impairment.

**Results:** All measures were significantly correlated with functional impairment. Depressive symptoms mediated the relationship between OCD symptom severity and functional impairment.

**Conclusion:** These findings indicate that severity of OCD symptoms is not the only predictor of functional impairment; severity of depressive symptoms is a mediator between OCD symptom severity and OCD-related disability.
**Tonsillectomy/Adenoidectomy do not prevent symptom onset in Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcus**

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**Keywords:** PANDAS, tonsillectomy, adenoidectomy, group A streptococcus

**Objective:** In children presenting with OCD and or tics and with temporally associated GAS pharyngitis, parents and physicians consider surgical options to mitigate the illness course. Several case reports suggest that a tonsillectomy may improve the child’s neuropsychiatric symptoms (e.g., OCD/tics) yet this has not been tested in a large sample of clinical youth. Our objective is to determine if tonsillectomy/adenoidectomy impacts the GAS titers and chronicity of neuropsychiatric symptoms associated with PANDAS (Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcus).

**Methods:** We recruited 112 children with tics and/or OCD having a history of infection related symptom flare-ups or history of dramatic onset. 36 had a history of tonsillectomy and/or adenoidectomy. Assessment was made by intensive expert review and three streptococcal antibodies (ASO, DNASe B, and ACHO). Chronicity of OCD and/or tic symptom onset and surgical status were determined by medical records, and by parent and child report.

**Results:** 68% of our cohort had at least one of the three measured titers elevated independent of surgical status. Of the surgical group, 97.2% had a diagnosis of OCD and 91.2% had a diagnosis of tics (88.9% with both) vs 92.2% with OCD, and 85.6% with tic (77.8% with both) of the non surgical group. The average ages of OCD and TS onset were 5.92 and 6.04 respectively in the surgical group vs. 6.49 and 6.62 years for the non surgical group.

**Conclusion:** Streptococcal antibodies were not significantly different among groups and most developed symptoms after the surgery. Tonsillectomy/adenoidectomy does not seem to decrease the likelihood of neuropsychiatric symptoms or titer elevations in the PANDAS population.

**Research supported by:** The Rothman Endowment.

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**Preliminary Results of Family Based Cognitive-Behavioral Treatment for Preschoolers with Obsessive Compulsive Disorder**

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**Keywords:** Anxiety

**Objective:** Cognitive-Behavioral Therapy (CBT) with exposure and response prevention (E/RP) is efficacious for OCD and other anxiety disorders among otherwise typically developing youth. To date, the efficacy of CBT in children has been demonstrated in a number of open trials and controlled trials (Barrett et al., 2004; de Haan et al., 1998; Placenticini et al., 2011; POTS, 2004; Freeman et al., 2008). Unfortunately, there is a gap in the literature regarding the effectiveness of this approach for younger children. This study aims to evaluate the treatment efficacy of a modulated cognitive-behavioral therapy (CBT) approach for children ages 3 to 8 years of age inclusive with a principal diagnosis of OCD.

**Methods:** This investigation is a controlled trial of CBT in children ages 3-8 years with OCD. For inclusion, youth must meet diagnostic criteria for OCD based on a structured interview (the ADIS-IV-P) and a minimum score of 8 on the CYBOCS Compulsion Scale. Randomization occurs immediately following the pre-assessment and subjects will either receive CBT immediately or be assigned to the Treatment as Usual (TAU) arm in a 1:1 ratio. Treatment is a 12 session protocol delivered twice weekly.

**Results:** Preliminary findings are positive with a greater magnitude of OCD symptom reduction in the CBT group.

**Conclusion:** Considering the increasing awareness of OCD symptoms in young children our work provides preliminary clinically-relevant support for CBT with E/RP.

**Research supported by:** New Researcher Grant Awarded to Dr. Lewin by USF Research Council

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**Rates of Social Impairment of Youth with Tic Disorders as assessed by the Social Responsiveness Scale**

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Keywords: SRS, autism, tic disorders, Tourette Syndrome

Objective: Tic disorders, particularly Tourette Syndrome (TS), are often associated with comorbid conditions that can greatly impact psychosocial functioning. Studies have shown a higher than chance co-occurrence of tic disorders and Autism Spectrum Disorders (ASDs) in youth. Through data obtained from a CDC funded study evaluating quality of life in youth with tic disorders, we aim to assess the prevalence of symptoms associated with ASD through the use of the Social Responsiveness Scale (SRS). The SRS is a brief rating scale measuring the severity of social impairment indicative of an ASD.

Methods: 93 youth with a tic disorder (82% male, ages 6-17) were administered the Computerized Diagnostic Interview Schedule for Children (C-DISC IV), SRS parent, and Yale Global Tic Severity Scale (YGTSS).

Results: Youth with tic disorders demonstrated significantly decreased social competency on many dimensions of the SRS. Of sampled children, 46% scored within the normal range, 38% in the mild-moderate range and 16% in the severe range. As measured by the YGTSS, the tic severity mean was 22.5 (range 4-50). Subjects who tested in the mild or above range were shown to experience slightly greater tic severity (mean 24.9). 64.7% of females tested within clinically significant range on the SRS, with a mean tic severity of 26.8. Whereas 51% males tested within clinically significant range, with a mean tic severity of 21.58.

Conclusion: We found that a large portion of youth with tic disorders have SRS scores in the clinical range. Further research is needed to determine the contribution of various comorbidities including ASD to impaired social functioning in youth with tic disorders.

Research supported by: Center for Disease Control

Distractions and Diversions: Preliminary Results from a Study Examining the Academic Impact of Pediatric Obsessive-Compulsive Disorder

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Keywords: Subjective Well Being, Obsessive-Compulsive Disorder, Academic Impact

Objective: This presentation offers preliminary results from a study exploring the relationship between pediatric obsessive-compulsive disorder (OCD) and student subjective well-being (SWB). Investigation has the potential to explain why the disorder impacts some youth more strongly than others, which could inform systemic efforts at prevention and early intervention for pediatric OCD.

Methods: A non-experimental correlational addressed the research questions for this study via collection and analysis of rating scale and clinical interview data. Participants (preliminary n=34) were recruited from families seeking treatment from the Rothman Pediatric Neuropsychiatry Clinic at the University of South Florida. In addition to basic descriptive analyses, Pearson Product-Moment Correlation Coefficients (PPMCC) were calculated between measures of symptom severity and participant SWB ratings.

Results: Participants’ ages ranged from 7-16 years (M=11.6). The primary measure of OCD symptom severity (CY-BOCS Total Score) ranged from 5-29 (M=24.2) on a 30-point scale. SWB ratings ranged from -32 to 51 (M=20.84) on a 120-point scale. Correlation coefficients between SWB and symptom severity (CY-BOCS Obsessive and Compulsive sub-scores, and Total score) ranged from low (r=-.02, SWB:Compulsive) to moderate (r=-.13, SWB:Total; r=-.20, SWB:Obsessive).

Conclusion: Results are consistent with previous findings of increased OCD prevalence among males in school-aged populations. A moderate relationship was found between obsession severity and SWB. This finding supports the hypothesis that as the severity endorsed by participants with respect to obsessive thoughts increased, corresponding SWB was more likely to be lower than that reported by participants with less severe obsessions.
The Causes of ALTEs (Apparent Life-Threatening Events) in Infants Evaluated at a Community Hospital
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**Keywords:** Retrospective Chart Review ALTE GERD

**Objective:** An ALTE is defined as an episode that is frightening to the observer and is characterized by some combination of apnea, color change, change in muscle tone, and choking or gagging. Current medical literature suggests approximately 30-40% of ALTEs are due to gastro-esophageal reflux, while up to 50% of cases remain unexplained. As the vast majority of research on the causes of ALTEs comes from tertiary care centers, the results may be distorted by referral patterns for varying etiologies. Our study examines the diagnoses and risk factors associated with ALTEs at a community hospital.

**Methods:** All known cases of ALTEs were identified, from January 2005 to May 2011. These were split into inpatient, ER, and SIDS records. Statistical analysis was performed, focusing on discharge diagnoses and potential risk factors. Based on physician observation, our hypothesis was that closer to 80-90% of ALTEs at a community hospital would be associated with gastro-esophageal reflux.

**Results:** A total of 333 charts were evaluated for potential ALTEs during the study period, with 154 cases included. Overall, gastro-esophageal reflux was seen in 127/154 ALTE cases (82.5%). Of the 70 inpatient cases, 68 (97.1%) were associated with some level of reflux. Potential risk factors were evaluated in the inpatient group and included smoke exposure (44.3%), pet exposure (30%), cardiac defects (20%), prematurity (18.6%), and URIs(15.7%).

**Conclusion:** Gastroesophageal reflux is the principle etiology of ALTEs in pediatric patients presenting at the community hospital level. Consequently, children with a history of GERD may be at increased risk for an ALTE. In addition, smoking, pet exposure, cardiac defects, prematurity, and URIs may exacerbate or increase the likelihood of an ALTE.

**Research Supported by:** This research was supported by a stipend from the Scholarly Concentrations Program at USF Health, Morsani College of Medicine

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**Plac1 (Placenta-Specific 1) is Paternally Imprinted and Necessary For Normal Placental and Embryonic Growth.** Suzanne Jackman, M.D.1, Xiaoyuan Kong, M.D.1, Michael Fant, M.D.1,2,3

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**Keywords:** placenta, X-inactivation, knock out mouse

**Objective:** The aim of this study was to determine the role of imprinting on Plac1 function during development.

**Methods:** Plac1 was deleted in murine ES cells and bred against a C57BL/6 background. Timed matings were established between wild type (WT) or hemizygous males and heterozygous (het) or WT females. Placentae were obtained at various gestational ages. Placental morphology was analyzed using IHC and Plac1 mRNA expression was assessed by Q-RT-PCR. Embryos were genotyped using a PCR-based strategy.

**Results:** Plac1 deletion resulted in placentomegaly in Plac1-null mice as well as hets where the mutant allele was inherited from the mother (XPlac1X). This was associated with expansion and disorganization of the junctional zone. By contrast, het placentae where the mutant allele was inherited from the father (XXPlac1) were indistinguishable from WT consistent with preferential inactivation of the paternal X-chromosome. Growth dynamics, however, suggested that paternally expressed Plac1 escaped complete X-inactivation. XPlac1X placentae peaked in weight at e16.5 followed by a slight decline thereafter. By contrast, KO placentae continued to increase in weight after e16.5 suggesting a gene dosage effect. Q-RT-PCR confirmed that XPlac1X placentae expressed Plac1 although at lower levels than XXPlac1 placentae. Additionally, IHC analysis indicated that paternally-derived Plac1 is expressed only in labyrinthine trophoblasts.

**Conclusion:** Plac1 is essential for normal placental and embryonic growth. It is paternally imprinted but exhibits partial escape from X-inactivation. Additionally, paternally-derived Plac1 appears to be expressed in a trophoblast lineage- specific manner.

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**PLAC1 (Placenta Specific-1) Expression is Differentially Affected by Labor in Distinct Trophoblast Populations**

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**Keywords:** PLAC1, placenta, fetal membranes, labor, parturition

**Objective:** PLAC1 is an X-linked gene whose expression is restricted primarily to cells of trophoblast lineage. It is essential for normal placental development but its role there has not been defined. The objectives of this study were to examine the expression of PLAC1 by human trophoblasts derived from chorionic villus tissue and the chorion laeve, and determine the effect of labor on its expression.

**Methods:** Chorionic villus tissue and fetal membranes were obtained from normal, human placentae at term delivered in the presence or absence of labor. PLAC1 mRNA was measured by Q-RT-PCR. Paraffin-embedded sections were analyzed by IHC.

**Results:** PLAC1 expression in chorionic villus tissue was 100% higher in the absence of labor than in the presence of labor. There was no difference in expression associated with spontaneous or induced labor. Additionally, PLAC1 was expressed in fetal membranes where it localized to trophoblasts of the chorion laeve. Its expression there, however, was not influenced by the presence or absence of labor.

**Conclusion:** PLAC1 is expressed by trophoblasts of the chorion laeve as well as the chorionic villi, extending its role at the maternal-fetal interface to include the fetal membranes. PLAC1 mRNA expression in the chorionic villi was significantly lower in pregnancies associated with spontaneous or induced labor, suggesting that PLAC1 expression decreases in response to labor. The significance of this observation to parturition is not known but it is consistent with a role for PLAC1 in the maintenance of the maternal-fetal interface. Future efforts are aimed at defining the functional role(s) of PLAC1 at the cellular level.

**Research supported by:** March of Dimes #6-FY09-503

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**Exploration of Mobile Technology and Social Media Use to Enhance Adolescent Self-Management of Asthma**

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**Keywords:** social media technology, social marketing, qualitative, asthma, teens

**Objective:** Adolescents with asthma are the least compliant age group for disease self-management. Considering the increased popularity of mobile technology and social media use, the researchers explored the potential for such platforms to deliver asthma education, to monitor current asthma clinical status and to strengthen self-management.

**Methods:** The social marketing framework guided qualitative research methods to explore adolescent and caregiver perceptions on asthma management, and attitudes toward the use of social media and mobile technologies in asthma care. 18 in-depth interviews were conducted with adolescents and their caregivers. Interview guides reflected the marketing mix that would later inform the construction of technological tools and a marketing plan to address teen asthma monitoring and self-management.

**Results:** Teens and caregivers are willing to participate in an database system, whereby patients send measures to the database and receive tailored feedback in response via mobile devices. Suggested message content includes medication, peak flow reading reminders and pollen counts. Participants reported interest in receiving alerts when their asthma status worsens, including recommended treatment strategies. Participants varied in their willingness to participate in asthma related social networking.

**Conclusion:** More exploration on the relevance of social networking sites as a platform for skill-building asthma education is needed among teen asthmatics. Mobile devices constitute a viable platform to assist adolescents with monitoring their asthma and have the potential to lead to improved asthma self-management.

**Research supported by:** USF College of Medicine

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**Aquaporin 5 is Expressed in the Murine Placenta and Regulated by Placenta-specific 1 (Plac1)**

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**Keywords:** Aquaporin 5, PLAC1, placenta, fetal membranes

**Objective:** Aquaporin 5 (AQ5) is a water channel protein expressed in the placenta which is involved in the transport of water and solutes. Binding to the placenta induce labor, suggesting that PLAC1 expression decreases in response to labor. The significance of this expression in maintaining the maternal-fetal interface. Future efforts are aimed at defining the functional role(s) of PLAC1 at the cellular level.

**Methods:** Chorionic villus tissue and fetal membranes were obtained from normal, human placentae at term delivered in the presence or absence of labor. PLAC1 mRNA was measured by Q-RT-PCR. Paraffin-embedded sections were analyzed by IHC.

**Results:** PLAC1 expression in chorionic villus tissue was 100% higher in the absence of labor than in the presence of labor. PLAC1 mRNA expression in the chorionic villi was significantly lower in pregnancies associated with spontaneous or induced labor, suggesting that PLAC1 expression decreases in response to labor. The significance of this observation to parturition is not known but it is consistent with a role for PLAC1 in the maintenance of the maternal-fetal interface. Future efforts are aimed at defining the functional role(s) of PLAC1 at the cellular level.

**Research supported by:** March of Dimes #6-FY09-503
**Pathology and Cell Biology University of South Florida College of Arts and Sciences Geography, Environment and Planning**

**Keywords:** placenta, aquaporin 5, Plac1

**Objective:** Aqp5 is a transmembrane, water–selective channel protein linked to osmotic transmembrane water transport. The objectives of this study were to examine the expression of Aquaporin 5 (Aqp5) in the murine placenta and confirm its regulation by placenta-specific 1 (Plac1). Plac1 is a placenta-restricted gene that is essential for normal placental development. Deletion of the Plac1 gene results in placentomegaly and intrauterine growth retardation. Differential gene microarray analysis of mutant placentae at e16.5 identified aquaporin 5 (Aqp5) as one of the genes most significantly down-regulated (15-fold) in Plac1 mutant mice.

**Methods:** Plac1 was deleted in murine ES cells and bred against a C57BL/6 background. Timed matings were established between wild type (WT) or hemizygous males and heterozygous (het) females. Placentae obtained at e16.5 were subjected to differential gene microarray analysis using the NIH 15k mouse embryo gene microarray. Aqp5 mRNA was measured by Q-RT-PCR. Aqp5 protein was localized by immunofluorescence microscopy.

**Results:** Aqp5 mRNA was significantly down-regulated (>95%) in placentae associated with Plac1-null and het embryos compared to WT placentae. Immunofluorescence analysis demonstrated Aqp5 immunoreactivity in the spongiotrophoblast as well as labyrinthine trophoblasts, where placental transport and maternal-fetal exchange occurs.

**Conclusion:** These data suggest that Aqp5 may play also a role in regulating water transport and homeostasis at the maternal-fetal interface. Furthermore, they demonstrate that Plac1 expression is a major determinant of Aqp5 expression.

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**Compulsive Hoarding in Community Environments**

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**Keywords:** Compulsive hoarding, community, prevalence, cost

**Objective:** Compulsive hoarding is a severe mental health condition that causes significant impairment to individuals and affects their communities. While the majority of previous research has focused on hoarding in aging samples or clinically referred patients, this study explored the frequency, characteristics and outcomes of hoarding situations encountered in community settings.

**Methods:** Prior to in-service training, 236 code enforcement officials and social service staff completed surveys about their experiences with hoarding cases.

**Results:** Analyses revealed responders encounter between 2-3 hoarding cases per year, yielding an annual prevalence rate of 33 per 100,000. As each hoarding case was projected to cost over $3,700 in trash removal fees, hoarding is a costly concern. Detailed hoarding encounters for 197 respondents revealed that hoarders were most often between 46-75 years old, Caucasians, lived alone and had little to no insight into their hoarding problem. Hoarding situations were frequently identified as incredibly cluttered and caused moderate to severe interference in functioning. Situations appeared to be difficult to resolve and often involved multiple agencies. Difficulty in resolution may stem from the fact that 83% of these professionals had received no prior training for addressing hoarding situations.

**Conclusion:** Overall, compulsive hoarding is costly and often hazardous for the hoarder and the community. Given that multiple agencies are involved in addressing hoarding cases, the development of an evidence-based inter-agency response protocol may facilitate situational resolutions and result in timely referrals to mental health professionals to improve outcomes for compulsive hoarders.

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**ipad in the Clinical Setting: Using Interactive Technology as a Bridge to Clinical Education**

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**Keywords:** iPad; technology; computer-based; patient education

**Objective:** Technology has a profound effect on how patients can be educated by their doctors by adding an interactive visual to teaching, encouraging patients to feel comfortable to engage their doctor, promoting adherence, and enhancing patient understanding of their health.

**Methods:** Patient ages 13 to 24 years, attending a pediatric specialty clinic and from diverse educational and socioeconomic backgrounds, were offered computer-based education
on several topics during their routine medical visit. Powerpoint presentations were created and online videos were reviewed, scored by educational topic, and viewed by patients on an iPad. After the session, patients were asked to rate their learning experience in comparison to standard provider education by an anonymous survey, rating relevance, accessibility, and degree of difficulty navigating. **Results:** Powerpoint presentations on the topics of substance abuse, pregnancy prevention, adherence to medication therapy, and disclosure of STD diagnosis were created. An average of 10 online videos per topic was assessed for accuracy, iPad compatibility, relevance, patient appropriateness, and length. The iPad does not support Adobe Flash, 8 out of 38 videos could not be used. Length ranged from less than 1 minute (min) (24%) to 16 min with an average of 7 min. The majority of the video contents were felt to provide accurate and appropriate information. Collection of patient’s impressions were useful to future applications in the clinic. **Conclusion:** Use of an iPad has the potential to enhance patient’s education and utilize patient’s waiting time for health education. The application of this technology was viewed as a helpful, interactive and attractive method facilitating patient-provider interaction. **Research supported by:** Department of Pediatrics