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2013 Pathways to Cures- Clinical and Translational Science Day at UCI

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2013 Pathways to Cures: Clinical Translational Research Day at UCI

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Poster Session Abstracts

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Poster	Title	Page
1	THE FIRST VALIDATED NOMOGRAM TO PREDICT 30-DAY MORTALITY FOLLOWING SURGERY FOR SMALL BOWEL OBSTRUCTION	5
2	RANDOMIZED ASSESSMENT OF ALCOHOL CONSUMPTION WITH COMPUTERIZED ALCOHOL SCREENING AND BRIEF INTERVENTION FOR ADULT EMERGENCY PATIENTS	5
3	Elimination of Colorectal Cancer – The Atlas Colon Health Network	6
4	ENDOCKSCOPE™: USING MOBILE TECHNOLOGY TO CREATE GLOBAL POINT OF SERVICE	6
5	Diffuse Optical Technologies for Quantitative Functional Measurements in Preclinical and Clinical Investigations	7
6	3D quantitative endoscopy using stereo CMOS-camera pairs	7
7	Identification and Characterization of Activation-Induced Cytidine Deaminase (AICDA) gene mutations and gene expression pattern in a Hyper IgM Syndrome Patient	8
8	A Decade Analysis of Surgical Trends and Outcomes of Colorectal Cancer in the Aging Population in the United States	8
9	A New Immunodeficient Pigmented Retinal Degenerate Rat Strain To Study Transplantation of Human Cells	9
10	A Novel Approach to Nanocarrier Targeting and Drug Delivery in vivo.	9
11	A PHASE I TRIAL OF BETAINE (TRIMETHYLGLYCINE) AS A TREATMENT FOR INSULIN RESISTANCE IN HUMANS: BASELINE DATA	10
12	A Positron Emission Tomography Study on Neuropsychological Performance and Regional Glucose Metabolism after Traumatic Brain Injury	10
13	A TAILORED INTERNET-BASED PROGRAM FOR PEDIATRIC ANXIETY AND POSTOPERATIVE PAIN: WEBTIPS	11
14	Acceleration as a Quantitative Measure of Coma Arousal in Rodents after Cardiac Arrest	11
15	Action Observation Stroke Therapy and long-term maintenance of motor gains	12
16	Acupuncture's Long-Lasting Effect in Hypertension: Role of Acupoint Specificity	12
17	Acute Affective Response to Moderate-Intensity Exercise; Association with Adolescents' Long-Term Physical Activity	13
18	ADDITIONAL EVIDENCE FOR EFFICACY OF STELLATE GANGLION BLOCK IN TREATING PTSD	13
19	ADULT NEUROGENESIS FOLLOWING BRAIN INJURY	14
20	AFFECTIVE RESPONSE TO EXERCISE AND PHYSICAL ACTIVITY AMONG ADOLESCENTS: MODERATION BY CONSISTENCY AND STABILITY OF THE AFFECTIVE RESPONSE TO EXERCISE	14
21	Amelioration of the Typical Cognitive Phenotype in a Patient with the 5pter Deletion Associated with Cri-du-chat syndrome in Addition to a Partial Duplication of CTNND2	15
22	ANASTOMOTIC LEAK FOLLOWING ANTERIOR RESECTION FOR RECTAL CANCER: DOES THE PRESENCE OF A DEFUNCTING STOMA REDUCE THE BURDEN OF A LEAK?	15
23	ARE ULTRASONOGRAPHICALLY OBTAINED COMMON BILE DUCT MEASUREMENTS IN EMERGENCY DEPARTMENT PATIENTS WITH SYMPTOMATIC GALLSTONES USEFUL?	16
24	ATHENA BREAST HEALTH NETWORK: A UC-WIDE PROGRAM TO IMPROVE BREAST HEALTH CARE AND RESEARCH	16
25	BABY ASSESSMENT AND BREASTFEEDING INSTRUCTION AND EDUCATION MEDICAL CLINIC PILOT (BABIEM)	17
26	Biomechanical Comparison of the Lower Trapezius Transfer Versus the Latissimus Dorsi Transfer for Irreparable Massive Posterosuperior Rotator Cuff Tears	17
27	BMP4 SUFFICIENCY FOR CHOROID PLEXUS EPITHELIAL FATE INDUCTION FROM MOUSE AND HUMAN EMBRYONIC STEM CELLS	18

Poster	Title	Page
28	BRAIN SEGMENTATION IN AUTISM SPECTRUM DISORDERS – AN ANATOMICAL AND DIFFUSION-TENSOR IMAGING INVESTIGATION	18
29	BREAST CANCER RISK FACTORS AND GAIL RISK SCORE DISTRIBUTION IN A HEAVILY HISPANIC POPULATION	19
30	Breath Gases as Biomarkers in Cystic Fibrosis	19
31	CANINE-ASSISTED INTERVENTION FOR CHILDREN WITH ADHD: PRELIMINARY FINDINGS FROM PROJECT POSITIVE ASSERTIVE COOPERATIVE KIDS (P.A.C.K.)	20
32	Caregivers' perception of infant physical activity in premature babies-Pilot testing a new survey tool	20
33	Chronic pain leads to disruption of mesolimbic dopamine function in response to opioids	21
34	COLORECTAL FELLOWSHIP PROGRAMS IN THE UNITED STATES: HOW ARE WE DOING?	21
35	Comparison of Automated vs Manual Determination of the Respiratory Variations in the EKG Waveform Recordings	22
36	COMPARISON OF RADIOFREQUENCY ABLATION VS. CRYOABLATION FOR ATRIOVENTRICULAR NODAL REENTRANT TACHYCARDIA IN PEDIATRICS	22
37	Computer Guided Reactivation of p53 Cancer Mutants	23
38	Construct Validity of a Cost-effective Assessment of Orthopaedic Surgical Skills via the Fundamentals of Orthopaedic Surgery (FORS)	23
39	CORTICAL INTERHEMISPHERIC CONNECTIVITY AND SPECTRAL POWER IN RELATION TO BEHAVIORAL DEFICIT IN ACUTE ISCHEMIC STROKE	24
40	Deep Tissue Imaging for Cancer Detection Using FLIM	24
41	DESERT HEDGEHOG DEFICIENCY ACCENTUATES PERIPHERAL NERVE DEMYELINATION	25
42	Developing Ergonomic Training Materials for Vietnamese Supermarket Workers with a Community Participatory Approach	25
43	DEVELOPMENT AND ASSESSMENT OF A NOVEL PERIOPERATIVE ULTRASOUND CURRICULUM FOR ANESTHESIOLOGY RESIDENTS	26
44	DIFFERENCES IN POSTOPERATIVE BEHAVIORAL CHANGES IN HISPANIC AND WHITE CHILDREN	26
45	Differential Alternative Splicing of VEGF in Human Placenta of Normal and Preeclamptic Pregnancies	27
46	EFFECTIVENESS OF MATERNAL AND INFANT HOME VISITATION MODELS ON BIRTH OUTCOMES: A PRELIMINARY ANALYSIS OF MOMS ORANGE COUNTY DATA	27
47	Effects of Children's Temperament on Analgesics Administered by Parents After Surgery.	28
48	EFFECTS OF MARIJUANA USE ON COGNITIVE PERFORMANCE AND BRAIN ACTIVITY IN YOUNG ADULTS WITH AND WITHOUT ATTENTION-DEFICIT/HYPERACTIVITY DISORDER	28
49	Effects of region-specific neural stem cell therapy on corresponding behavioral outcomes	29
50	Effects of School-Based Taekwondo Training on Executive Function and Health Outcomes: The Healthy for Life Pilot Taekwondo Study	29
51	Electroacupuncture Activated Pathway from Caudal Ventrolateral Medulla to Rostal Ventrolateral Medulla	30
52	EMERGENCY DEPARTMENT VS. RADIOLOGY DEPARTMENT PELVIC ULTRASOUND AND EFFECT ON PATIENT LENGTH OF STAY: A RANDOMIZED CONTROL TRIAL	30
53	ENHANCED COMA RECOVERY AFTER CARDIAC ARREST IN A RAT MODEL USING OREXIN-A	31
54	ENHANCED HEPCIDIN EXPRESSION IN THE RAT PROXIMAL DUODENUM AND THE ROLE OF IRON IN EXPERIMENTAL DUODENAL ULCERATION	31
55	ENHANCING ULTRASOUND EDUCATION THROUGH VOLUNTEER PARTICIPATION IN CARDIAC SCREENING	32
56	EVALUATING THE ACCURACY AND PRECISION OF THE MASIMO LABS/MASIMO CORPORATION PULSE CO-OXIMETER HEMOGLOBIN MONITOR	32

Poster	Title	Page
57	EVALUATING THE IMPACT OF THE CLINIC IN THE PARK: A COMMUNITY BASED OUTREACH PROGRAM	33
58	EXERCISE AND A HIGHER FAT DIET MAY INFLUENCE THE PHYSICAL HEALTH OF INDIVIDUALS WITH VCP INCLUSION BODY MYOPATHY WITH PAGET DISEASE AND FRONTOTEMPORAL DEMENTIA	33
59	Femtosecond Laser "Mini-Bubble" Deep Lamellar Dissection for DALK and DSAEK	34
60	GENOMIC STUDIES IN AUTISM: CLUES TO PATHWAYS AND THERAPIES	34
61	GEOGRAPHIC PREVALENCE OF TRAUMA MECHANISMS IN AN URBAN SETTING	35
62	Glioma big potassium channel expression in human cancers and possible T cell epitopes for their immunotherapy.	35
63	GLOBAL GENE PROFILING IDENTIFIES DYSREGULATED PATHWAYS IN VCP-ASSOCIATED MYOPATHY	36
64	GOAL-DIRECTED FLUID MANAGEMENT BASED ON MONITORING OF PLETH VARIABILITY INDEX (PVI)	36
65	Going beyond the air leak test – Our initial experience with the use of a new grading system utilizing flexible endoscopy for the intraoperative evaluation of stapled rectal anastomoses.	37
66	HUMAN ES-DERIVED MOTOR NEURON PROGENITOR CELL IMPLANTATION IN CONUS MEDULLARIS / CAUDA EQUINA INJURY	37
67	Human Myeloid-Derived Suppressor Cells Induced from Healthy Donor Peripheral Blood Mononuclear Cells After Co-Culture with Human Placental Cell Lines	38
68	Human Retinal Progenitor Cells for Retinitis Pigmentosa	38
69	Impact of Inflammatory Biomarkers on Relation of High Density Lipoprotein-Cholesterol with Incident Coronary Heart Disease: Cardiovascular Health Study	39
70	IMPORTANCE OF PARAVENTRICULAR NUCLEUS IN MODULATORY ACTIONS OF ACUPUNCTURE ON EXCITATORY CARDIOVASCULAR FUNCTION	39
71	Influenza mortality in the United States, 2009: Burden and timing	40
72	Initial Outcomes of Femtosecond Laser-Assisted Zig-zag Configuration Deep Anterior Lamellar Keratoplasty	40
73	Intelligence Test Result Comparison between Prader Willi Syndrome (PWS) Patients Treated with or without Growth Hormone, and patients with Uniparental Disomy and Deletions	41
74	Isokinetic muscular contractions with blood flow restriction reduces oxygen extraction during moderate intensity fatiguing exercise in the vastus medialis oblique	41
75	LARGER CORTICAL ACTIVATION AFTER INCOMPLETE SPINAL CORD INJURY	42
76	LIPID-ENRICHED DIET RESCUES LETHALITY AND SLOWS DOWN PROGRESSION IN A MURINE MODEL OF VCP-ASSOCIATED DISEASE.	42
77	LONG TERM IMPROVEMENT OF UROFLOWMETRY, AUA, AND QUALITY OF LIFE SCORES AFTER ROBOTIC ASSISTED RADICAL PROSTATECTOMY (RARP) PERSISTS AFTER 5 YEARS	43
78	LONGITUDINAL ASSOCIATIONS BETWEEN TELOMERE LENGTH, PSYCHOLOGICAL STRESS AND IMMUNE PROFILE IN CERVICAL CANCER SURVIVORS	43
79	MARIJUANA USERS ASSOCIATED WITH INATTENTION IN MEN AND SLEEP QUALITY IN WOMEN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER	44
80	Mechanisms of Neurotrophic Resistance in Alzheimer's Disease by the "IL-1 Effect" and Potential Restorative Therapies Using More Targeted Anti-Inflammatory Approaches	44
81	Modulation of opioid tolerance and hyperalgesia by ultra-low dose naloxone is independent of Toll-like receptor-4.	45
82	mTOR Signaling Modulates the Effects of Cytotoxic Chemotherapy on B-ALL Cells	45
83	Neuronal differentiation of ASD specific fibroblast derived iPSCs to functional neurons and glia	46
84	Niacin, an old drug with new therapeutic use for the treatment of non-alcoholic fatty liver disease (NAFLD)	46
85	Nocturnal versus Daytime Pad Free Continence Following Robot Assisted Radical Prostatectomy (RARP) and Implications	47

Poster	Title	Page
86	Opioids modulate cardiac spinal afferent responses to ischemia and other mediators	47
87	PARTNERSHIP WITH THE DISCOVERY SCIENCE CENTER: TOWARDS INCREASING DIVERSITY IN HEALTH CARE AND BIOMEDICAL FIELDS	48
88	PERIOPERATIVE EVALUATION OF PSYCHOPHYSIOLOGICAL STRESS RESPONSES IN ADULT SURGICAL PATIENTS	48
89	PHYSICAL ACTIVITY, BODY FAT, AND ENDOTHELIAL FUNCTION IN MEXICAN AMERICAN MALE ADOLESCENTS	49
90	Post-Keratoplasty Astigmatism Correction with Toric Intraocular Lenses	49
91	PREDICTING FACTORS THAT INCREASE THE RISK OF HAVING BREAKTHROUGH URINARY TRACT INFECTION IN PEDIATRIC PATIENTS WITH PRIMARY VESICoureTERAL REFLUX	50
92	PRELIMINARY FINDINGS OF OUTCOMES FROM THE UC IRVINE CHILD DEVELOPMENT SCHOOL	50
93	PREVALENCE AND CLINICAL IMPORT OF THORACIC INJURY IDENTIFIED BY CHEST CT BUT NOT CHEST RADIOGRAPH IN BLUNT TRAUMA PATIENTS	51
94	PRIMARY ULTRASOUND ASSESSMENT	51
95	Repetitive Electroacupuncture Attenuates Cold-Induced Hypertension and Simultaneously Enhances rVLM Preproenkephalin mRNA Expression	52
96	Robotic Assisted Radical Prostatectomy (RARP) and Localized Hypothermia's Impact on Continence and Inflammatory Response	52
97	SIGNALING PROFILE OF THERMAL TRAUMA (SPoTT) – EXUDATE ANALYSIS IN ACUTE BURN PATIENTS	53
98	SIGNIFICANT IMPROVEMENTS IN ADOLESCENT POMPE DISEASE WITH ERT, NUTRITION AND EXERCISE.	53
99	SIMULATION-BASED STRUCTURED INTERVIEWS STRATIFY RESIDENCY CANDIDATES IN PHASE ONE	54
100	Sleep Quality Impacts Outcome of Prolonged Exposure Therapy for PTSD	54
101	Small Cell Lung Cancer cells express a late stage tumor antigen, gBK; its implications for preventing the terminal disease.	55
102	ST. JUDE NEIGHBORHOOD CENTER HEALTHY LIFESTYLES PROGRAM	55
103	SUCCESS OF LUMBAR PUNCTURE AFTER USING ULTRASOUND TO IDENTIFY LANDMARKS	56
104	TELOMERE LENGTH AND IRON OVERLOAD: THE INFLUENCE OF PHENOTYPE AND GENOTYPE	56
105	THE AUTISM IN PRESCHOOLERS STUDY (T.A.P.S.)	57
106	The Biomechanical Effects of the Remplissage Technique for Engaging Hill-Sachs Lesions	57
107	The cardiovascular phenotype of human MPS I is recapitulated in the canine and murine MPS I model systems	58
108	The Effect of Extracellular Matrix Proteins from Lung on the Migration of Breast Cancer Cells	58
109	The effects of incorporating service-learning into a health mentorship program	59
110	The Pharmacological Evaluation of a Rodent Model of Low Back Pain Due to Degenerative Disc Disease - the Beta-Catenin Mouse Model	59
111	THE ROLE OF THE WNT/BETA-CATENIN SIGNALING PATHWAY AT THE MOTOR ENDPLATE FOLLOWING TRAUMATIC NERVE INJURY	60
112	The use of Diffuse Optical Spectroscopy in Exercise Physiology and Metabolic Disease	60
113	THREE WINDOW BEDSIDE ULTRASOUND VS. CHEST X-RAY FOR CONFIRMATION OF ENDOTRACHEAL TUBE PLACEMENT	61
114	Use of iPad in Enhancing Teaching during Teaching Rounds: A Qualitative Pilot Study	61
115	YIELD AND CLINICAL PREDICTORS OF THORACIC SPINE INJURY FROM CHEST COMPUTED TOMOGRAPHY FOR BLUNT TRAUMA	62

Poster #: 1

THE FIRST VALIDATED NOMOGRAM TO PREDICT 30-DAY MORTALITY FOLLOWING SURGERY FOR SMALL BOWEL OBSTRUCTION

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Objective: Surgery for small bowel obstruction (SBO) is associated with significant mortality. To date, there have been no studies examining the interaction of several variables and their effect on mortality. Our aim was to construct a comprehensive and validated model that takes into account all the factors that predict mortality in patients undergoing surgery for SBO. **Design:** The ACS-NSQIP database was retrospectively reviewed from 2005-2010 for operative SBO cases caused by adhesions or incarcerated hernias. Using 30-day mortality as the primary endpoint, a predictive model was built using preoperative, operative and postoperative variables. **Results:** A total of 17,379 cases were identified. SBO was caused by adhesions in 74% of cases whereas incarcerated hernia accounted for the remaining 26%. The 30-day mortality was 5.7%. LASSO identified several predictors of mortality listed in table 1. The following factors were not found to predict mortality: gender, obesity, smoking, diabetes, emergency surgery, surgery day, disease type, and the use of laparoscopy. The predictive model performed well with a high predictive power and an AUC=0.92. **Conclusion:** This is to date the most powerful and the only validated nomogram to predict 30-day mortality following surgery for SBO. This model represents an easy-to-use tool for surgeons to risk-stratify and counsel patients and can be used as a quality outcome measure. Implementing strategies to modify certain risk factors may lower mortality rates.

Coefficient LASSO OR Intercept -6.30 - Preoperative Factors

ASA V	1.66	5.27	ASA IV	0.82	2.27	Disseminated cancer	0.80	2.24	Ventilator dependent	0.78	2.18	Septic shock	0.75	2.12	Dialysis dependence	0.40	1.50	Sepsis	0.38	1.46	Peripheral vascular disease	0.28	1.32	BUN >40	0.24	1.27	Ascites	0.21	1.23	COPD	0.18	1.19	Weight loss >10%	0.08	1.09	Age (absolute number multiplied by coefficient)	0.04	1.04	Pneumonia	0.03	1.03	Creatinine >1.2	0.02	1.02	Hematocrit <38	0.02	1.02
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Operative Factors

Gangrene	0.51	1.66	Bowel resection	0.15	1.16	Contaminated case	0.07	1.07	Postoperative Complications Shock	1.64	5.18	CVA	1.05	2.87	Acute renal failure	0.90	2.47	Re-intubation	0.71	2.03	Myocardial infarction	0.64	1.89	Bleeding	0.17	1.18	Return to OR	0.11	1.12	Failure to wean	0.05	1.06	Pneumonia	0.04	1.04
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Keywords: Small Bowel Obstruction; Colorectal; Nomogram; ACS-NSQIP; Surgery

Poster #: 2

RANDOMIZED ASSESSMENT OF ALCOHOL CONSUMPTION WITH COMPUTERIZED ALCOHOL SCREENING AND BRIEF INTERVENTION FOR ADULT EMERGENCY PATIENTS

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OBJECTIVES/SPECIFIC AIMS: Computerized Alcohol Screening and Brief Intervention (CASI) is a program used to screen patients for alcohol consumption levels and provide education and resources to improve attitudes and habits towards alcohol for those determined to be at risk of alcohol dependence. The goal of this prospective randomized study is to measure the change in self reported alcohol consumption at 1 week, 3 months, and 6 months following ED administration of the computerized alcohol screening (CASI) and brief negotiated intervention (BNI) with referral to treatment as compared to standard of care for at-risk drinkers. **METHODS/STUDY POPULATION:** This is a prospective randomized study in a tertiary care university hospital (UC Irvine Medical Center). CASI was administered to ED patients 18 years or older by researchers using a bilingual computerized tablet (English and Spanish) from the hours of 8AM to midnight, every day of the week. Subjects were randomized based on a random number generator. The researchers were blinded to the subjects' answers. Alcohol use was then assessed via call or online follow-up at 1 week, 3 months, and 6 months. The data was analyzed using Stata, and compared by demographic groups by descriptive statistics and the chi-square test for independence. Risk was calculated using AUDIT scores. **RESULTS/ANTICIPATED RESULTS:** It is notable that all patients scored in the at-risk group, but on follow up, all but 3 had lowered their AUDIT score. 7 Subjects who were barely high risk became low risk, while 8 patients who scored in the high risk range became low risk. There was no significant difference in the AUDIT score change between the CASI and CASI with BNI groups. **DISCUSSION/SIGNIFICANCE OF IMPACT:** At 3 month follow-up, early all of the 15 of the 18 subjects who followed up had decreased their AUDIT score. At this time there is no significant difference in the AUDIT score change between the CASI and CASI with BNI groups. Computerized BNI may be no more effective than standard of care and the screening exam alone may be able to decrease drinking in the ED population. CASI is a low investment for potentially high returns and allows MD and nursing to focus on high risk patients by looking at their AUDIT score. Research has shown that brief intervention decreases binge drinking by 66%, lowers monthly alcohol intake from 3-18 drinks and up to 48% compared to non-intervention groups. The goal is that this screening and brief intervention will not only decrease the level of alcohol consumption among all patients, but steer them towards making better decisions about their overall well-being.

Keywords: alcohol; intervention; computerized; clinical trial; randomized

Poster #: 3

Elimination of Colorectal Cancer – The Atlas Colon Health Network

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Up to 90% of colorectal cancer (CRC) cases are preventable or curable through combinations of life-style changes, screening and removal of precancerous polyps. Yet, as a cause of cancer-related death, CRC remains second overall and first among nonsmokers in the United States. Barriers to risk-lowering behaviors include lack of knowledge, failure of care providers to recommend CRC screening, fear, inconvenience, costs, and difficulty navigating the medical system. The Atlas Colorectal Health (ACH) Network is designed to break these barriers and reduced CRC incidence by 90+% in Orange County. The cornerstone of ACH is an NCI-validated web-based survey that estimates an individual's current and lowest possible risk for CRC. The survey is easily administered using any web-accessible device and provides immediate feedback of risks, factors contributing to risk and ways to reduce risk. Educational outreach will improve knowledge of risk assessment and risk-lowering behaviors among care providers and their patients. Those at highest risk will be stratified for referral to specialized multi-disciplinary "high-risk" clinics. Outcomes of the program will be continuously assessed and compared to pre-ACH metrics of screening rates, knowledge and behaviors among providers and patients, and cancer incidence and mortality. Continuous improvements will be achieved by identifying and overcoming persistent barriers and fine-tuning the risk assessment model. ACH will be piloted in UCI-affiliated primary care clinics, then expanded to penetrate all primary care clinics in Orange County, and finally to the general public.

Keywords: Colorectal cancer; Prevention; Screening

Poster #: 4

ENDOCSCOPE™: USING MOBILE TECHNOLOGY TO CREATE GLOBAL POINT OF SERVICE

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Objective: Recent advances and the widespread availability of mobile technology have ushered in a new wave of innovations in healthcare. Herein, we present our initial experience with Endockscope (EDS) (Orange, CA), a new docking system that optimizes the coupling of a smartphone (iPhone 4S) with modern endoscopes. **Methods:** Using the USAF resolution target, we compared the image resolution (line pairs/mm) of a flexible cystoscope (Karl Storz) coupled to the EDS-iPhone to an existing HD camera (Storz H3-Z Versatile HD Camera). We then utilized the Munsell ColorChecker chart, to compare the color resolution with a 0 degree laparoscope (Storz). Furthermore, 12 expert endoscopists blindly compared and evaluated images from a porcine model using a cystoscope and ureteroscope for both systems. Finally, we also compared the cost (average of 2 companies) and weight (lbs) of the two systems. **Results:** Overall, the image resolution allowed by the EDS coupled smartphone was identical to the resolution of the traditional HD camera (4.49 vs. 4.49 lp/mm). Red ($\Delta E = 9.26$ vs. 9.69) demonstrated better color resolution for iPhone, but green ($\Delta E = 7.76$ vs. 10.95), and blue ($\Delta E = 12.35$ vs. 14.66) revealed better color resolution with the Storz HD camera. Expert reviews of cystoscopic images acquired with the Storz HD camera were superior in image, color and overall quality ($p = 0.002, 0.042, \text{ and } 0.003$). In contrast, the ureteroscopic reviews yielded no statistical difference in image, color and overall ($p = 1, 0.203 \text{ and } 0.120$) quality. The overall cost of the EDS + iPhone was \$154 compared to \$46,623 for a standard HD system. The weight of the mobile-coupled system was 0.47 lbs and the weight of the Storz HD camera was 1.01 lbs. **Discussion:** The amalgamation of evolving consumer mobile technology with flexible fiberoptic endoscopes may prove to be a critical step in providing the benefits of endoscopically driven healthcare to people all across the globe.

Keywords: mobile technology; telemedicine; telehealth; endoscopy; laparoscopy

Poster #: 5

Diffuse Optical Technologies for Quantitative Functional Measurements in Preclinical and Clinical Investigations

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Beckman Laser Institute and Medical Clinic

Diffuse Optical Technologies (DOT) are non-invasive device builds that use optical principles to enable quantitative measurements of tissue structure (scattering) and function (perfusion, oxy and deoxy hemoglobin concentration, oxygen saturation, total hemoglobin, water fraction, lipid fraction). These technologies are developed in part to enable quantitative longitudinal studies in both preclinical animal models and human subjects. DOT devices developed at the Beckman Laser Institute are capable of quantitative measurements that will allow us to draw comparisons among data collected in serial measurement sessions on a single patient and among patients measured at different sites worldwide. Furthermore, with absolute quantitation of tissue parameters, we envision the possibility of epidemiologic studies based on DOT to facilitate development of physiologically/clinically meaningful metrics of tissue function (e.g., “normal” vs. “abnormal” blood flow). These tools are expected to provide researchers with highly versatile, quantitative, cost-effective tools to study disease progression and therapeutic response with 1) a high degree of fidelity and localization, and 2) sufficient spatiotemporal resolution, interrogation depth, and field-of-view to study events that have broad practical relevance, from surgical guidance to clinical management. Here we present demonstrations of three DOT platform technologies; 1) laser speckle imaging (LSI) 2) spatial frequency domain imaging (SFDI) and 3) diffuse optical spectroscopy (DOS). In addition to device demonstrations, we will present a poster that will summarize results obtained from a myriad of collaborative preclinical and clinical studies with the goal of illustrating the types of investigations that we are equipped to pursue.

Keywords: tissue imaging; spectroscopy; blood concentration and flow; preclinical imaging

Poster #: 6

3D quantitative endoscopy using stereo CMOS-camera pairs

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Inspired around a year ago by an ICTS lecture from Dr Ken Chang, Chief, Division of Gastroenterology, UC Irvine School of Medicine...we present the design and experimental creation of a novel 3D-endoscope based on the use of micro-CMOS detector array technologies arranged in a prototype proof-of-concept instrument of the size of a regular endoscope used for intestinal observations and surgery. We solve the problems of giving the surgeon quantitative 3D-vision inside cavities in the human body, so that precision assessment of obstructions and growths etc can be made, and surgery conducted in 3D - instead of the normal 2D, which is particularly difficult for surgeons. Following a one-time calibration, semi-automated quantitative plots of the 3-D landscape some 50mm to 60-mm range ahead of the endoscope can be viewed on a 3D screen (eg, on a laptop computer) overlaid on, or side-by side with the scene being observed. Range estimates are of order 150-microns accuracy using VGA CMOS cameras in our experiment, and will improved to 45-micron minimum-error - when we use HDTV-format cameras, because of the smaller pixels available. These accuracies are sufficient for surgeons to have excellent 3D knowledge of obstructions or growths that they may be dealing with, and for tracking changes over time through repeated measurements and comparisons. The value of this new instrumentation lies in its enhancement of medical endoscopy through 3D vision and spectroscopy, in-situ diagnostics of growths etc. Further value is expected through the potential reduction in costs of 3D-vision, also enhanced ruggedness and portability by elimination of optical fiber endoscope approaches. The simple demonstration here will be extended to 3D-panoramic and ‘surround’ 3D through the use of multiple-cameras embedded in the endoscopic probe. We also expect to add photo-dynamic therapy, laser-spectroscopic and laser-ablative techniques to enhance the analytical endoscopy tool-kit further.

Keywords: 3D; endoscope

Poster #: 7

Identification and Characterization of Activation-Induced Cytidine Deaminase (AICDA) gene mutations and gene expression pattern in a Hyper IgM Syndrome Patient

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Hyper-IgM syndrome (HIGM) is a primary immunodeficiency syndrome, which is characterized by normal or increased serum IgM, and extremely reduced serum IgG, IgA and IgE, and recurrent infections and often autoimmune diseases. HIGM is caused by defective class switch recombination (CSR) from immunoglobulin (Ig)M to IgG/IgE/IgA, and associated with defect in somatic hypermutation (SHM) in variable regions (VH) of Ig. We studied a patient with autosomal recessive HIGM had associated with autoimmune thrombocytopenia (cell-associated IgM anti-platelet antibodies). By cloning and DNA sequencing of several related genes to HIGM in genomic DNA from patient, we identified two mutations from AICDA gene: 1. homozygous mutation substituted A to G, located at up-stream 4 base pairs (-4bp) of Exon 1 (promoter region); 2. missense homozygous mutation substituted G to C, located at Exon3, cDNA codon 260 bp (260G>C) predicting the substitution of serine for cysteine at protein N terminal 87 (C87S). Immunological finding indicated patient has defect in CSR from IgM to IgG, and DNA sequencing of VH3 and VH3 of Ig cDNA from B cells indicated the patient lacks of SHM in B cells. Microarray analysis of gene expression change patterns in B and T cells from this patient provided insight into molecular biosystem changes in both cells and revealed altered functional groups and signaling pathways associated with AICDA gene mutation. Up-regulated genes involved in functional groups including B and T cells differentiation and proliferation, mRNA process, chromosome organization, protein translation, and cellular response to oxidative stress; in signaling transduction pathways including B and T cells development and their receptor (BCR, TCR) signaling pathways, antigen processing and presentation, autoimmune disease, and proteasome signaling pathways. Down-regulated genes mainly involved in signal transduction phosphorylation in B cells such as MAPKKK cascade, inflammation, defense response and cells migration. In conclusion, we identified two novel mutations in AICDA gene from patient with autosomal recessive HIGM. Microarray analysis of B and T cells gene expression changes highlights alteration in genes regulating T cell function beside B cells only. This would suggest that autosomal recessive HIGM is a syndrome of both B cells and T cells rather than the current classification as a disorder of B cells, and explain that why HIGM patients always associated with autoimmune disease. Furthermore, up-regulated expression change genes involved in fundamental cell processes may provide candidate genes to study the regulations of epigenetic, transcription and signaling pathway in B and T cell from the patient and to explore molecular mechanism, genes and drug for therapeutic HIGM patients with AICDA mutations.

Keywords: None

Poster #: 8

A Decade Analysis of Surgical Trends and Outcomes of Colorectal Cancer in the Aging Population in the United States

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Importance: The incidence of colorectal cancer in elderly patients is likely to increase with the aging population. **Objective:** This study aims to examine the surgical trends and outcomes of colorectal cancer treatment in the elderly. **Design:** A retrospective review of surgical cases for colorectal cancer was conducted. Patients were stratified within age groups of 45-64; 65-69; 70-74; 75-79; 80-84 and >85 years old. Post-operative complications and yearly trends were analyzed. A multivariate logistic regression was used to compare mortality and morbidity between individual groups >65 and patients 45-65 years old while controlling for gender, comorbidities, procedure type, diagnosis and hospital status. **Setting:** Elective and emergent admission for colorectal cancer **Participants:** Nationwide Inpatient Sample 2001-2010 **Main Outcome Measures:** 30-day mortality and morbidity **Results:** Among the estimated 1,043,108 colorectal cases sampled, 64% of cases were performed on patients >65, and 23% on patients >80. Patients >80 were 1.7 times more likely to undergo emergent admission than those <65. During 2009-2010, patients <65 accounted for 46% of the laparoscopic cases performed in the elective setting compared to 14% for patients >80. Overall mortality over the 10 year period has decreased by an average of 6.6% with the most considerable decrease observed in the population >85 (9.1%). Patients >80 had an associated \$9,492 lower hospital charge and an increased 2.5 days length of stay compared to patients age <65. On multivariate logistic regression analysis, in-hospital mortality was associated with an increase in odds-ratio of 1.32 in the 65-69 group, 2.02 in the 70-74 group, 2.5 in the 75-79 group, 3.15 in the 80-84 group, and 4.72 in the >85 group when compared to patients age 45-64 (p<0.01). Morbidity was associated with an increased odds-ratio of 1.25 in the 65-69 group, 1.40 in the 70-74 group, 1.54 in the 75-79 group, 1.68 in the 80-84 group, and 1.96 in the >85 group compared to patients age 45-64 (P<0.01). **Conclusion:** The majority of colorectal surgery for colorectal cancer is performed on the aging population. Despite the improved outcomes seen over the last 10 years for mortality, the risk-adjusted mortality and morbidity of the elderly continues to be substantially higher than the younger population.

Keywords: None

Poster #: 9

A New Immunodeficient Pigmented Retinal Degenerate Rat Strain To Study Transplantation of Human Cells

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Objective: To develop an immunodeficient rat model of retinal degeneration (RD) that will not reject transplanted human cells (“RD nude rats”).
Methods: The RD nude rat was generated by initially intercrossing females hemizygous for the S344ter transgene by male homozygous NIH nude rats. Final matings resulting in heterozygous female and homozygous male breeders for the Foxn1 mutation with the S344ter transgene carried on one or both alleles in both female and male breeders. The Foxn1 mutation was identified via phenotype; heterozygous animals have hair while homozygous animals are hairless. In general, hemizygous Foxn1 females produced normal litter sizes that exhibited normal survival. Female homozygous S334ter line 3 rats (Tg S334ter3Lav) which carry a mutant human opsin transgene were crossed with male pigmented NIH nude rats (NTac:NIH-Whn) which carry a mutation in the Foxn1 gene, in a breeding contract with Taconic. The offspring after several crosses and back-crosses were homozygous for Foxn1 and homo- or heterozygous for S334ter (“RD nude rats”). Immunodeficiency was tested by transplanting sheets of hESC-derived neural progenitor cells to the subretinal space of 12 RD nude rats (39-45d old), and, as a control, 8 homozygous standard nu/nu rats (43-51d old). Rats were housed in sterile microisolator cages, sacrificed between 8d and 6 months after surgery, and eye sections analyzed by immunohistochemistry for human, neuronal and glial markers. The new strain was donated to the Rat Research Resource Center (RRRC) and re-derived to a pathogen-free status for distribution to interested investigators (RRRC# 539 SD- Foxn1 Tg(S334ter)3LavRrrc, available at Objective: To develop an immunodeficient rat model of retinal degeneration (RD) that will not reject transplanted human cells (“RD nude rats”).
Methods: Female homozygous S334ter line 3 rats (Tg S334ter3Lav) which carry a mutant human opsin transgene were crossed with male pigmented NIH nude rats (NTac:NIH-Whn) which carry a mutation in the Foxn1 gene. The offspring after several crosses and back-crosses were homozygous for Foxn1 and homo- or heterozygous for S334ter (“RD nude rats”). Immunodeficiency was tested by transplanting sheets of hESC-derived neural progenitor cells to the subretinal space of 12 RD nude rats (39-45d), and 8 homozygous standard nu/nu rats (43-51d). Rats were sacrificed between 8d and 6 mo. after surgery, and analyzed for human, neuronal and glial markers. The strain was donated to the Rat Research Resource Center (RRRC) and re-derived to a pathogen-free status for distribution to investigators (RRRC# 539 SD- Foxn1 Tg(S334ter)3LavRrrc, available at www.rrrc.us.)

Keywords: retinal degeneration; immunodeficient; human cell transplantation; stem cells

Poster #: 10

A Novel Approach to Nanocarrier Targeting and Drug Delivery in vivo

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The long-term goal of this research is to develop novel means of delivering chemotherapeutic agents directly to tumor cells and away from normal cells. To date, most targeted delivery strategies have attempted to target a cell surface protein. In contrast, we are developing delivery systems that target tumor or tissue polysaccharides (also termed “glycans”). Extracellular glycans are present in all organ and tumor systems; their compositions are remarkably specific to the individual organ or tumor. A proof of principle study shows targeted delivery of nanocarriers to liver parenchymal cells by targeting heparan sulfate, a glycan known as a glycosaminoglycan. Liposomes were chosen as the model nanocarrier; the targeting was achieved by a 19-amino acid peptide attached to the liposome. This peptide specifically interacts with highly sulfated heparin sulfate (characteristic of liver) and does not interact with other glycosaminoglycans or other polysaccharides. This system delivers the chemotherapeutic drug doxorubicin specifically to liver parenchymal cells. Effective targeting occurs both in vitro and in vivo, with rapid release of liposome contents upon arrival at the target organ. Our future studies will target the glycans of cancer cells. Liposomes will include peptides or antibody fragments designed to target the extracellular glycosaminoglycan (GAG) microenvironment of tumors. GAGs are abundantly over-expressed by nearly all tumors. Tumor GAGs differ in composition from those of normal tissue; it is their novel composition that allow tumor-specific targeting. At this time, we are testing our technology on hepatocellular carcinoma and colon carcinoma models. This work will address long-standing issues that have impeded the development of liposome delivery systems. These include: 1) rapid, “active” targeting to the target tumor, 2) delivery beyond vasculature and into parenchymal regions, and 3) rapid release of contents upon arrival at the targeted tissue or tumor.

Keywords: drug delivery; doxorubicin; liposomes; nanocarriers; targeting

Poster #: 11

A PHASE I TRIAL OF BETAINE (TRIMETHYLGLYCINE) AS A TREATMENT FOR INSULIN RESISTANCE IN HUMANS: BASELINE DATA

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Betaine (trimethylglycine) is a chemical compound that is found naturally in the human body and is available in several foods and as an over-the-counter dietary supplement. In mice models of non-alcoholic liver disease (NAFLD), betaine treatment reversed NAFLD and eliminated insulin resistance. However, no large studies of betaine treatment have been performed in human subjects with NAFLD and small clinical trials have had conflicting results. The primary aim of this clinical trial was to obtain preliminary data on the efficacy of betaine treatment in humans with mild insulin resistance. This is a prospective, unblinded, non-randomized, dose escalation study of oral betaine in subjects with insulin resistance. Twenty male subjects with insulin resistance were enrolled at the VA Long Beach Healthcare System. Insulin resistance was defined as a fasting glucose of 100-125mg/dL and a HOMA-IR score >3.0. Study participant duration was five months, which included a 4-week lead-in period with a placebo supplement for compliance assessment and three months of dose escalation of betaine from 4g, then 8g, then 12g of daily total intake, divided in twice daily dosing. Subjects were also evaluated four weeks after betaine treatment had ended. The primary outcome was change in insulin resistance, as measured by HOMA-IR values, between the value when betaine was started and when betaine was stopped. Secondary outcomes included changes in fasting glucose, homocysteine, hemoglobin A1c, liver enzyme, cholesterol, and serum betaine levels. Several participants are still in the treatment phase; projected completion will occur within the next few months. Baseline data (demographics, blood tests) will be available for presentation. Data from this trial will provide estimates for planning a Phase II trial of efficacy, including a better idea as to sample size, dosage, and methodology. If betaine is found to be effective in this study and in future clinical trials, it might offer a safe and inexpensive treatment for humans with insulin resistance and/or NAFLD. Grant support: received a Pilot Project Award from the University of California-Irvine Institute for Clinical and Translational Sciences

Keywords: Betaine; Insulin resistance; Nonalcoholic fatty liver (NAFL)

Poster #: 12

A Positron Emission Tomography Study on Neuropsychological Performance and Regional Glucose Metabolism after Traumatic Brain Injury

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Traumatic brain injury (TBI) often results in impairment of memory, speed of information processing, and executive functions due to diffuse axonal injury caused by the disruption of cortical white matter pathways. Positron Emission Tomography (PET) is a useful noninvasive functional neuroimaging technique that measures regional glucose metabolism. The use of PET analysis will provide physicians with an enhanced understanding of the underlying brain damage, thus allowing them to create better treatment plans for their patients. This retrospective study examines the association between reaction time (RT) and regional glucose metabolism following TBI specifically in superior parietal lobule (SPL), putamen, and temporal insula. We hypothesized that there is a direct correlation between glucose metabolism and RT in particular regions of the brain that are involved in visual, spatial, and motor processing. All subjects (n=23) had mild to moderate TBI and underwent PET scans 12 to 36 months after their injury. They also took a computerized neuropsychological test battery called : MicroCog on the day of the PET scan. Scans were normalized in SPM. A general linear model (GLM) analysis with reaction time as covariate was conducted. . There is a statistically significant correlation between longer reaction time and lower glucose metabolism in the superior parietal lobule (SPL) (p=0.0012)and the putamen (p<0. 0001) Additionally, there is a statistically significant correlation between longer reaction time and higher glucose metabolism in the temporal insula (p=0.0082). These findings suggest that longer reaction time is linked to significant glucose metabolism abnormalities in TBI patients in areas of the brain that are responsible for visual, motor, and spatial processing.

Keywords: traumatic brain injury; fractional anisotropy; corpus callosum; diffusion tensor imaging; neuropsychological performance

Poster #: 13

A TAILORED INTERNET-BASED PROGRAM FOR PEDIATRIC ANXIETY AND POSTOPERATIVE PAIN: WEBTIPS

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Introduction: The majority of children who undergo surgery experience significant preoperative anxiety and postoperative pain and preparation programs are not regularly used due to cost and time constraints of hospitals. This abstract describes the development and preliminary evaluation of an NICHD funded web-based tailored intervention that is aimed at reduction of preoperative anxiety and postoperative pain (WebTIPS). **Methods:** Phase 1 (development) – WebTIPS was developed over a period of 24 months with the help of an animation company (DMA) and with close collaboration of a team of anesthesiologists, child life specialists, psychologists and surgeons. WebTIPS consists of four parent-child modules (home before surgery, waiting room & induction, recovery room, and home after surgery) and provides tailored education, modeling, coping training, and pharmacological pain management. The intervention includes an interactive, animated tailored website that incorporates behavioral shaping and exposure techniques to prepare children and parents for surgery. Content is tailored based on parent and child characteristics such as type of surgery, coping style and baseline anxiety. WebTIPS consists of three parts, parent intake (input), tailoring matrix, and intervention (output). The program includes a separate animated child website that uses shaping and exposure strategies to prepare children for the day of surgery. Seven parent-child dyads accessed WebTIPS after having undergone surgery and six parent-child dyads accessed WebTIPS before undergoing surgery. Following the intervention, all parents completed a demographic measure and an evaluation questionnaire, rating the usability and likeability of WebTIPS on a 5 point Likert-type scale ranging from 0-4, with higher scores indicating more positive responses. All participants attended a focus group and an individual interview to examine perceptions and feasibility of WebTIPS. Transcriptions of the interviews were coded in a method consistent with grounded theory to identify common themes. Phase 2 (formative evaluation) – Seven parent-child dyads who had recently undergone surgery and six parent-child dyads scheduled to undergo surgery accessed the beta version of WebTIPS. Usability and feasibility was assessed through interviews and focus groups. Parents also rated the usability and likeability of WebTIPS on a 5 point Likert-type scale (0-4), with higher scores indicating more positive responses. Phase 3 (preliminary RCT)– Sixty children, ages 2-7 scheduled to undergo outpatient surgery and their parents participated in this study. The WebTIPS group had unlimited access to the website 5 days prior to surgery and for a total of 14 days. Adherence was assessed via time stamps of website access. Children's preoperative anxiety was assessed using the Modified Yale Preoperative Anxiety Scale (mYPAS).

Keywords: postoperative; pain; surgery; perioperative; anxiety

Poster #: 14

Acceleration as a Quantitative Measure of Coma Arousal in Rodents after Cardiac Arrest

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OBJECTIVES: Level of coma has traditionally been measured clinically (e.g. Glasgow Coma Scale, Four Score, etc.), or with neurodiagnostic tests (e.g. EEG). Developing more objective, longer term measures of coma could improve quantitation of arousal and tailoring of treatments. We used a post-cardiac arrest (CA) rodent coma model to test 3-D bodily acceleration as a wireless, continuous measure of early movement during coma arousal, and compared it to EEG based markers validated previously. **METHODS:** Five adult Wistar rats (Male, 300-350gms) underwent EEG electrode implantation 1wk prior to asphyxia-induced 7min CA. Four hours after resuscitation, rats were attached to a wireless EEG-accelerometer system. Wideband and sub-band EEG were analyzed to yield IQ, an entropy based and previously validated measure of coma arousal. We defined activity as the variability in 3-D acceleration as quantified by the standard deviation of acceleration. **RESULTS:** We found a significant positive linear correlation between accelerometer activity and full band EEG IQ ($R=0.68 \pm 0.12$, mean \pm SD). When EEG sub-bands were divided into two categories (0.3-50Hz and 50-150Hz), accelerometer activity had better correlation with higher frequency sub-bands ($R=0.32 \pm 0.14$ vs. $R=0.61 \pm 0.05$). **CONCLUSIONS:** These results suggest that 3-D acceleration based activity, measuring early subtle movements during coma arousal, correlates with EEG IQ. This relationship was stronger for higher frequency sub-bands. This suggests that subtle motor activity quantitated by an accelerometer may be an acceptable indirect measure of arousal. This system also has the advantage of being more objective, automated, and non-invasive, while also offering continuous longer term monitoring. Therefore, accelerometer-based monitoring for coma arousal may have potential clinical applicability in intensive care units and coma rehabilitation units.

Keywords: coma; cardiac arrest; stroke; intensive care; EEG

Poster #: 15

Action Observation Stroke Therapy and long-term maintenance of motor gains

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Action observation therapy (AOT) is a rehabilitative stroke treatment based on the physiology of the mirror motor system, using observation and imitation of movements to assist recovery of fine skills. Preliminary work has shown marked functional gains after AOT, yet it is unclear if gains persist long term. The goal of this study was to determine a) if gains after AOT are maintained long term b) brain functional changes associated with maintenance of gains or lack thereof. Seventeen subjects with stroke received either intense AOT or Bobath therapy (BT) for 4 weeks. Measures of motor performance and brain structure and function (T1 and fMRI) were assessed pre and post-treatment (Pre-Tr, Post-Tr), and 6-12 months post-treatment (Maint). fMRI data was processed with AFNI, using Freesurfer-generated regions of interest. Group functional activation maps were created. Both groups showed functional gains Post-Tr (Fugl-Meyer, WOLF). While gains after AOT were seen at Maint, BT subjects returned to base levels. Pre-Tr, all stroke subjects showed increases in activation in fronto-parietal regions compared to controls. Post-Tr, all subjects showed decreased activation in these regions, approaching control volumes. BT patients showed increased activation in cingulate cortex. At Maint, BT subjects reverted to increased activation in all regions, while AOT subjects showed further decreases in fronto-parietal activation. Decreased activation was associated with better motor performance Post-Tr; further improvement at Maint was seen with AOT. The latter increase in activation after BT was associated with reversion of gains to baseline. Previous studies have shown that decreases in fMRI activation are related to better recovery which may indicate better efficacy. The fact that AOT maintained and enhanced functional gains suggests reinforcement of previously established networks, while BT may involve compensatory movements with establishment of new, short lived networks.

Keywords: stroke; fMRI; motor activity

Poster #: 16

Acupuncture's Long-Lasting Effect in Hypertension: Role of Acupoint Specificity

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Objectives: Our purpose was not only to identify the most effective acupoints and parameters of electroacupuncture (EA) stimulation, but also to clarify the mechanisms of acupuncture's blood pressure (BP) lowering effect. **Methods:** We randomized 70 outpatients (age, 60±1.2 years; 33 men, 37 women, BP 140-180/90-110 mmHg) in a single-blinded fashion to an eight-week course of active acupuncture treatment (P5-6+St36-37) or control (LI6-7+G36-39), once weekly for 30 min over eight weeks. Participants, without antihypertensive medication, were assessed with 24 hour ambulatory BP monitoring (recording every 30 min during day and every 60 min at night) once every two weeks. Sixty one patients finished the treatment course. Among these sixty one patients, 36 received active acupoint treatment and 25 control acupoint treatment. Fourteen of 25 received crossover treatment after a two week rest period. **Results:** (1) Active acupoint stimulation: 36 patients demonstrated significant reductions in 24 hr peak and average systolic BPs from 176±2 to 168±2 and 144±2 to 140±2 mmHg(both p<0.05), respectively, after eight weeks of therapy. Average diastolic BP was reduced by 5 mmHg (p<0.05), while heart rate was unchanged. After the termination of EA treatment SBP remained lowered for four additional weeks, but thereafter returned to pretreatment levels. EA more effectively reduced BP during the day than at night. Control acupoint stimulation: 24 patients did not demonstrate changes in BP. Cross-over: 14 patients in the control group crossed over to active acupoint stimulation after initially receiving eight weeks of therapy at control points. Peak and average SBP were significantly reduced from 179±3 to 167±4 and 143±3 to 137±3 mmHg(both p<0.05). Peak and average DBP were significantly reduced from 112±5 to 104±4 and 88±2 to 84±3 mmHg(both p<0.05). **Conclusion:** These data suggest that EA at select acupoints, performed once weekly for 8 weeks, significantly reduces BP in patients with mild to moderate hypertension off antihypertensive therapy. This beneficial effect is slow in onset but persists for a prolonged period of time. (Supported by Adolph Coors Foundation, DANA Foundation, NIH HL-63313, HL-0721125, ICTS NIH UL1 TR000153 and Pioneer Talent of TCM, Shanghai)

Keywords: Acupuncture; Hypertension; Long-Lasting Effect; Acupoint Specificity

Poster #: 17

Acute Affective Response to Moderate-Intensity Exercise; Association with Adolescents' Long-Term Physical Activity

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Research in adults suggests that affective response to, or enjoyment of, exercise may be an important predictor of future physical activity (PA) behavior. However, the association has not been adequately explored in adolescents. The present study aimed to determine whether adolescents' affective response to an acute bout of exercise was associated with future PA behavior. One-hundred and ninety-two adolescents (mean age = 14.8) reported how they felt before, during, and after a 30 minute moderate-intensity exercise task on a cycle ergometer. Their physical activity levels were assessed at baseline and one year later. Results indicated that affective responses during and after exercise were not predictive of long-term PA behavior. However, baseline PA behavior was associated with PA behavior one-year later. These findings do not provide strong support for hedonic theory, which posits that enjoyment of a health behavior partially determines whether it is adopted and/or maintained. It may be, however, that baseline PA had been already determined by prior affective associations with exercise. Future studies should explore the association between affective response to exercise and PA behavior in the context of an intervention study and when appropriate psychosocial and/or environmental moderators are considered.

Keywords: Hedonic theory; Enjoyment of exercise; Physical activity; Adolescents; health behavior change

Poster #: 18

ADDITIONAL EVIDENCE FOR EFFICACY OF STELLATE GANGLION BLOCK IN TREATING PTSD

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INTRODUCTION: A number of case reports suggest that a unilateral stellate ganglion block (SGB), a procedure often used to help those with sympathetically mediated pain, can provide symptomatic relief lasting months for those suffering from post-traumatic stress disorder (PTSD). The stellate ganglion is a neural source of sympathetic outflow from the brain to the body. **Study Aims:** To confirm benefits and explore mechanisms of action of SGB for treatment of veterans with combat related PTSD. **Main outcome:** Change in Clinician Administered PTSD scale (CAPS) score. **Secondary outcome:** Change in peripheral psychophysiological responses (startle, heart rate and skin conductance) at rest and during a fear conditioning/fear extinction paradigm. **METHODS:** Six subjects with combat related PTSD were recruited from clinics at the Long Beach VA Healthcare System. Most subjects had experienced inadequate responses to other evidence based treatments for PTSD. All subjects received the SGB procedure in an open label design. Using fluoroscopic guidance, 7 cc of 0.25% bupivacaine local anesthesia was placed into the stellate ganglion area near the base of the neck. CAPS and psychophysiology measures were obtained at baseline and then again at 1, 4, 12 and 26 weeks. **RESULTS:** All subjects tolerated the procedure without difficulty and experienced no unexpected side effects. Four subjects reported symptomatic relief within minutes of having the block placed. Within this group there was a significant drop in CAPS scores (80, 33; $p < .05$). Two subjects did not find relief with the procedure. **CONCLUSIONS:** This open trial design concludes that SGB is a relatively simple, safe and effective treatment for PTSD. There appear to be some subjects who have a rapid (within minutes) and dramatic improvement in symptoms. Additional study is warranted to identify which subjects might be most helped by this procedure and to begin identifying potential mechanisms of action.

Keywords: PTSD; stellate ganglion block; anesthesia; CAPS

Poster #: 19

ADULT NEUROGENESIS FOLLOWING BRAIN INJURY

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Neuronal loss is a commonality of a spectrum of neurodegenerative disorders (Alzheimer's, Parkinson's and Huntington's disease) and traumas (stroke, epilepsy, and traumatic brain injury). Recently, studies indicate that neurogenesis may play a critical role to recover brain function and mitigate cognitive deficits following severe neuronal loss in traumas or in neurodegenerative disorders. However, the contribution of neuronal regeneration to this recovery remains limited and poorly understood. Here, we use the CaM/Tet-DTA model to selectively ablate neurons in the forebrain and hippocampus in young, irradiated, and aged mice. We found that neuronal ablation stimulates cell proliferation and differentiation in young and old CaM/Tet-DTA mice. However, these increases in neurogenesis do not mitigate the cognitive deficits induced after massive neuronal loss. Our studies suggest that multiple therapeutic approaches will be a better strategy to recover brain function in traumas and/or in neurological disorders.

Keywords: Neurobiology; Neurogenesis; Aging

Poster #: 20

AFFECTIVE RESPONSE TO EXERCISE AND PHYSICAL ACTIVITY AMONG ADOLESCENTS: MODERATION BY CONSISTENCY AND STABILITY OF THE AFFECTIVE RESPONSE TO EXERCISE

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OBJECTIVES/SPECIFIC AIMS: Affective responses to exercise are associated with physical activity (PA) and may predict future PA behavior. Evidence suggests that an affective style may underlie the documented variation in individuals' affective responses to exercise and may help explain variability in PA participation, yet research evaluating the affective response to exercise in terms of its "traitedness" (i.e., the degree to which the trait is expressed consistently) is scarce. The present study examined whether acute affective responses to exercise are consistent across situations and stable over time, and whether individual differences in the "traitedness" of these responses play a role in predicting future PA behavior. **METHODS/STUDY POPULATION:** Adolescents (n = 192; M age = 14.79; 55% male) provided Feeling Scale (FS; Hardy & Rejeski, 1989) ratings before and after two 30-minute exercise tasks (an unsupervised exercise task in a free-living environment and a lab-based moderate-intensity exercise task) and completed a one-week assessment of PA via accelerometry. One year later, participants repeated the unsupervised exercise task and the one-week PA assessment. **RESULTS/ANTICIPATED RESULTS:** Affective responses to exercise were mildly consistent across tasks (ICC = .251, p = .001) and mildly stable over time (ICC = .166, p = .044). The affective response to exercise predicted PA differently across levels of affective response consistency (B = -.326, p = .026) but not stability when controlling for baseline affect and past PA. The affective response- future PA relationship was more positive when adolescents' affective responses were strongly consistent than when they were moderately consistent. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Among adolescents who show strong consistency of their affective responses to exercise, this response positively predicts future PA. The findings may be useful for tailoring interventions to promote adolescent PA.

Keywords: physical activity; exercise; affect; affective style; adolescents

Poster #: 21

Amelioration of the Typical Cognitive Phenotype in a Patient with the 5pter Deletion Associated with Cri-du-chat syndrome in Addition to a Partial Duplication of CTNND2

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Cri-du-chat is a rare congenital syndrome characterized by intellectual disability, severe speech/developmental delay, dysmorphic features, and additional syndromic findings. The etiology of this disorder is well known, and is attributed to a large deletion on chromosome 5 that typically ranges from band 5p15.2 to the short arm terminus. This region contains CTNND2, a gene encoding a neuronal-specific protein, delta-catenin, which plays a critical role in cellular motility and brain function. The exact involvement of CTNND2 in the cognitive functionality of individuals with Cri-du-chat has not been fully deciphered, but it is thought to be significant. This report describes an 8-year-old African-American female with a complex chromosome 5 abnormality and a relatively mild case of Cri-du-chat syndrome. Because of the surprisingly mild cognitive phenotype, although a karyotype had confirmed the 5p deletion at birth, an oligo-SNP microarray was obtained to further characterize her deletion. The array revealed a complex rearrangement, including a breakpoint in the middle of CTNND2, which resulted in a partial deletion and partial duplication of that gene. The array also verified the expected 5p terminal deletion. Although the patient has a significant deletion in CTNND2, half of the gene (including the promoter region) is not only preserved, but is duplicated. The patient's milder cognitive and behavioral presentation, in conjunction with her atypical 5p alteration, provides additional evidence for the role of CTNND2 in the cognitive phenotype of individuals with Cri-du-chat.

Keywords: Cri-du-chat; partial deletion/partial duplication; amelioration; microarray; CTNND2

Poster #: 22

ANASTOMOTIC LEAK FOLLOWING ANTERIOR RESECTION FOR RECTAL CANCER: DOES THE PRESENCE OF A DEFUNCTING STOMA REDUCE THE BURDEN OF A LEAK?

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Objective: To examine if the presence of a defunctioning stoma performed during anterior resection for rectal cancer affects outcomes when an anastomotic leak occurs. **Methods** Using the Nationwide inpatient sample 2004-2010, we performed a retrospective review of rectal cancer cases that underwent anterior resection. We only selected cases that leaked and divided them into two groups based on the presence or absence of a defunctioning stoma. Patient demographics and comorbidities were listed, and outcomes were compared between the two groups on multivariate regression analysis. **Results:** We identified 3,099 anterior resections that leaked. A stoma was present in 28.6% of cases, especially in male patients (31.7% vs. 22.7% $p < 0.01$). When a leak occurred, the presence of a defunctioning stoma did not reduce mortality (OR=1.07; 95% CI 0.51-2.27; $p = 0.85$). However, the presence of a stoma was associated with an increased risk of infectious complications (OR=1.50; 95% CI 1.24-1.82; $p < 0.01$), sepsis (OR=1.58; 95% CI 1.08-2.32; $p = 0.05$), an increased length of stay by 2.46 days ($p < 0.01$). Furthermore patients with a defunctioning stoma had lower likelihood of routine discharge (OR=0.18; 95% CI 0.14-0.22; $p < 0.01$). **Conclusion:** The presence of a defunctioning stoma does not appear to reduce the burden of anastomotic leak following anterior resection for rectal cancer.

Keywords: Stoma; Leak; Resection; Rectal; Surgery

Poster #: 23

ARE ULTRASONOGRAPHICALLY OBTAINED COMMON BILE DUCT MEASUREMENTS IN EMERGENCY DEPARTMENT PATIENTS WITH SYMPTOMATIC GALLSTONES USEFUL?

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Background Within the emergency department, time and efficiency is crucial in managing and providing patient care with every minute potentially deciding life or death. By this, recording measurements of the common bile duct (CBD) diameter in a right upper quadrant (RUQ) ultrasound requires rigorous formal training, and prolongs patient's care and time in the emergency department. Due to the increased demands on emergency physicians and increased liability many physicians have deferred the use of the RUQ bedside ultrasound, resulting in a more costly and time-consuming formal radiology ultrasound. We sought to prove whether the measurement of the CBD has clinical utility to patients presenting to the emergency department requiring RUQ ultrasound. **Methods:** The target population of the study evaluated patients presenting to the UC Irvine Emergency department who were determined to require a RUQ ultrasound by a physician and had either a formal radiology study or bedside RUQ ultrasound. After informed consent, the patient's history, measurement of the CBD, gallbladder wall thickness, and blood lab results were collected. **Results:** Prospectively comparing the lab data and CBD ultrasound data of 26 patients, preliminary data appears to show a relationship between CBD dilation and bilirubin level. It has shown that CBD dilation and elevated levels of serum bilirubin levels indicated 88% specificity in confirming the presence common bile duct stones, while normal levels predicted 95% specificity in confirming the absence of stones. **Conclusion:** By eliminating the aspect of the CBD from the RUQ ultrasound, we hope to decrease the time it takes to perform the exam and increase emergency physician confidence in performing and interpreting the ultrasound, thus improving patient care.

Keywords: common bile duct; ultrasound; emergency department; gallstones

Poster #: 24

ATHENA BREAST HEALTH NETWORK: A UC-WIDE PROGRAM TO IMPROVE BREAST HEALTH CARE AND RESEARCH

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The UCI Athena Breast Health Network is part of a UC-wide collaboration of multi-disciplinary investigators whose mission is to improve breast health care and research. **OBJECTIVES:** 1) to provide women undergoing breast screening at UCI with a personalized breast cancer risk assessment; 2) to provide risk counseling for patients identified to be at elevated risk; and 3) to recruit research participants for a long-term epidemiology study on breast health. **METHODS:** Patients undergoing screening mammography at UCI clinics were given an online breast health questionnaire as a standard part of their clinical care. Risk factors and risk scores were provided to their radiologist and the Athena Breast Health Specialist. Patients identified to be at elevated risk were contacted by the Breast Health Specialist, who confirmed the patients' risk factors and provided information on risk-lowering strategies. Personalized risk reports and recommendations were then sent to the patients and their referring providers. All patients who completed the questionnaire were also asked if they would be willing to share their questionnaire data with the Athena research team. If so, they were enrolled as research participants. **RESULTS:** Close to 100% of screening mammography patients at UCI complete the questionnaire, and ~10% of patients are identified to be at elevated risk. ~70% of patients who complete the questionnaire consent to become research participants, and ~85% of research participants donate either a blood or saliva sample. **SIGNIFICANCE OF IMPACT:** Patients undergoing screening mammography at UCI are receiving a higher and more personalized standard of care because of the Athena program. As the program continues, the data and biospecimen repository will be a tremendous resource for discovery of novel risk factors and biomarkers for breast cancer, leading to better ways to screen, diagnose, treat, and prevent the disease.

Keywords: breast cancer; Athena; risk assessment; screening; prevention

Poster #: 25

BABY ASSESSMENT AND BREASTFEEDING INSTRUCTION AND EDUCATION MEDICAL CLINIC PILOT (BABIEM)

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Objectives: Outcomes measured included: 1) prenatal breastfeeding goals 2) breastfeeding exclusivity and duration rates for a maximum of 6 months 3) milk supply at discharge and 4) documentation of maternal breastfeeding problems and their treatment under the current system vs. the pilot project. Methods: Using prospective convenience sampling, mothers of hospitalized infants with an EGA of 31-36 weeks were enrolled. Preliminary Results: The control group consists of 27 mothers and the intervention enrollment (n=19+) is still ongoing. Control group mothers had significantly less mean milk [373cc (n=27) vs. 645cc (n=19) two-tailed p <0.02; 95% confidence interval -37.2, -506.8] and were less likely to have a full milk supply (equal or > 400cc) at discharge [41% (n=27) vs. 68% (n=19)]. One-month duration and exclusivity intervention group rates were higher [94% and 65% (n=17) vs. 88% and 42% (n=27)]. Both groups had problems with milk supply and infant latch. Control group mothers were less likely to receive help with their problems after hospital discharge. Most intervention group mothers received prescriptive therapy for low milk supply and all were offered assistance with latch and breastfeeding issues. Discussion: Mothers of premature infants have high acuity levels and need prompt, convenient care. Having access to a breastfeeding medicine specialist, who has prescriptive privileges, is imperative to maintenance of lactation. However, one barrier not anticipated post-discharge involved mothers who declined to attend weekly clinical visits. Usually, this was due to transportation issues yet; they still attended primary care provider (PCP) appointments or accepted help via the phone. For this intervention to work in this population, either home visits need to be arranged, transportation to appointments provided or the provision of breastfeeding services must be an integral component of follow-up care either, by or in conjunction with, the PCP.

Keywords: breastfeeding; prematurity; lactation; low milk supply; galactogogues

Poster #: 26

Biomechanical Comparison of the Lower Trapezius Transfer Versus the Latissimus Dorsi Transfer for Irreparable Massive Posterolateral Rotator Cuff Tears

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Objectives: The purpose of this study was to compare the biomechanical effects of the trapezius (trap) transfer and the latissimus dorsi (lat) transfer in a cadaveric model of a massive posterolateral rotator cuff tear. Methods: Eight cadaveric shoulders were tested at 0°, 30°, and 60° of abduction in the scapular plane. Rotational range of motion and humeral rotation angle due to muscle loading were measured. Glenohumeral kinematics and joint reaction forces were measured throughout the range of motion. After testing in the intact condition, the supraspinatus and infraspinatus were resected, simulating a massive rotator cuff tear. The lower trap transfer was then performed. Three trap loading conditions (12N, 24N, 36N) were applied to simulate lengthened, properly tensioned, and over-constrained grafts, respectively. Next the lat transfer was performed and tested. A repeated-measures ANOVA was used for statistical analysis. Results: Internal rotation due to muscle loading increased with massive cuff tear at all abduction angles (p < 0.05). This was restored with the lat transfer at 0° abduction and the trap transfer at all abduction angles. Massive cuff tear decreased glenohumeral joint compression, which was restored with the trap transfer at all positions (p < 0.05). At neutral rotation and 0° abduction, there was an increase in the anteriorly directed force for the massive cuff tear and lat transfer conditions, that was restored to intact values by the trap transfer (p < 0.05) At maximum internal rotation and 0° of abduction, the apex of humeral head shifted superiorly and laterally after massive cuff tear (p <0.05); this abnormal shift was more closely restored to intact values by the trap transfer than the lat transfer (p <0.05). Discussion: The trap transfer is biomechanically superior to the lat transfer in restoring native glenohumeral biomechanics and joint reaction forces. Clinical studies to evaluate the trapezius transfer are warranted.

Keywords: Orthopaedic Surgery; Biomechanics; Shoulder

Poster #: 27

BMP4 SUFFICIENCY FOR CHOROID PLEXUS EPITHELIAL FATE INDUCTION FROM MOUSE AND HUMAN EMBRYONIC STEM CELLS

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Choroid plexus epithelial cells (CPECs) secrete cerebrospinal fluid, establish the blood-CSF barrier, and play important roles in brain development and homeostasis. CPEC dysfunction has been implicated in many neurologic and psychiatric disorders. CPEC transplant therapy could treat these otherwise intractable disorders. However, sources of donor tissue are extremely limited and CPEC cannot be expanded ex vivo. Embryonic stem cell-derived CPEC would provide an unlimited cell source for these therapies. Here we demonstrate CPEC differentiation from mouse and human embryonic stem cell (ESC)-derived neuroepithelial cells. First, we established an aggregation-based neural induction method. Next, we applied BMP4 to ESC-derived neural precursors, based on the known BMP signaling requirement for CPEC induction in vivo. CPEC specification by BMP4 was restricted to an early time period after in vitro neural induction, with peak CPEC competency correlating to neuroepithelial cells rather than radial glia. BMP4 was sufficient to upregulate CPEC markers in a dose-dependent fashion. Further characterization of the derived CPECs showed vesicular morphology and epithelial sheets that co-labeled for the CPEC markers ZO1, Aqp1, and Tr. By electron microscopy, the cells exhibited CPEC ultrastructural features such as juxtalumenal tight junctions and abundant microvilli. The secretory function of dCPECs was confirmed by their ability to self-assemble into vesicles. Postmitotic dCPEC can be purified from this culture system by FACS and other methods. The purified dCPEC have been transplanted into mice via intraventricular injection. The cells successfully engraft into the host CP epithelium. These data demonstrate that BMP4 is sufficient to induce CPEC fate in vitro and that ESC-derived NECs are selectively competent for CPEC fate. Further, these ES-derived CPEC provide a donor source for transplantation therapies and pave the way for a CPEC-based regenerative medicine

Keywords: embryonic stem cells; choroid plexus; transplantation

Poster #: 28

BRAIN SEGMENTATION IN AUTISM SPECTRUM DISORDERS – AN ANATOMICAL AND DIFFUSION-TENSOR IMAGING INVESTIGATION

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OBJECTIVES This exploratory study aims at finding possible differences in brain macroanatomy in young subjects with autism spectrum disorder (ASD) as compared to typically developing controls. The baseline datasets from this study will be used to raise funding to continue this study with a larger sample. The goal is to find an imaging biomarker which will aid in the diagnosis of autism and more targeted behavioral and pharmacological intervention plans. **STUDY POPULATION** We conducted 11 anatomical MRI examinations of subjects with a prior diagnosis of ASD (2 female, 9 male, ages 12-19 years). An age-matched control group of 10 normally developing children (1 female, 9 male, ages 12-19 years) was compiled that were scanned using the same imaging protocol on the same scanner during the same time frame. An ASD diagnosis was reconfirmed or rejected, and other psychological disorders excluded, using the Kiddie Schedule for Affective Disorders and Schizophrenia-Epidemiological Version (KSADS-E). All 21 participants happen to be right-handed. **DATA ACQUISITION** T1-weighted MR images were acquired on a Philips Achieva 3T scanner, equipped with an 8-channel phased array coil, using a TFE sequence with TR 11 ms, TE 3.7 ms, flip angle 18 degrees, 150 sagittal slices with a matrix of 240 x 240 voxels, corresponding to a isotropic resolution of 1.0 mm. Diffusion-weighted images were acquired on the same scanner and coil, using a diffusion-weighted spin-echo sequence with TR 7.0 s, TE 80.0 ms, ip angle 90 degrees, 60 axial slices with a matrix of 144 x 144 voxels, corresponding to a resolution of 1.67 x 1.67 mm (in plane), 2 mm slice thickness, 48 gradient directions at b = 1000 s/mm², one gradient-free acquisition, and one acquisition with isotropic gradients at b = 0 s/mm². Note that at an angulation of 30 degrees w.r.t. the AC-PC plane, not the full intracranial space is imaged: approximately 2 cm of the superior frontal lobe and 4 cm of the posterior cerebellum are cut off. Besides the images, the following variables were collected: group label (GRP, C = control, A = study group), gender (GEN, M = male, F = female), age at time of examination (AGE, in years). Two ASD datasets and one control dataset had to be eliminated due to motion artifacts. **METHODS** A quantification of group-related differences in brain structures was sought for. T1 weighted imaging data were analyzed using the following processing steps: 1. Scan data in Philips PARREC format were converted into BRIAN format, aligned with the stereotactical coordinate system and interpolated to an isotropical voxel size of 1mm using a fourth-order b-spline method. 2. All datasets were registered with the MNI{152 head using a recent approach for nonlinear registration. All registered head images were averaged, correcting for the mean intensity.

Keywords: autism; MRI; anatomical imaging; DTI; brain anatomy

Poster #: 29

BREAST CANCER RISK FACTORS AND GAIL RISK SCORE DISTRIBUTION IN A HEAVILY HISPANIC POPULATION

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Objectives: Athena integrates risk assessment into breast cancer screening. Women at highest cancer risk are identified and offered personalized counseling and preventive referrals. A difference in risk factor distribution between Hispanics and non-Hispanic whites has been shown. This study will describe these factors in Athena, a heavily Hispanic population. Methods: Patients completed a questionnaire at the time of their mammography and consented to enroll in Athena. Data was collected on medical, reproductive, and family history. BMI was calculated using self-reported weight and height. NCI-Gail breast cancer scores were calculated using age, age at menarche and 1st pregnancy, family history of breast cancer, number of biopsies and biopsies with atypia, and ethnicity. Elevated breast cancer risk was defined as a score > 1.67 . In our cohort of 1,407, 64% were Hispanic (n=903) and 20% were non-Hispanic white (n=277). Results: Mean ages (yrs) of the two groups were 53.9 and 60.6. Hispanics had a significantly higher rate of obesity compared to non-Hispanic whites (42 vs 30%; $p < 0.0001$), diabetes (11 vs 3%; $p < 0.0001$) and hypertension (27 vs 21%; $p < 0.04$) and a lower rate of family cancer history ($p < 0.015$). Hispanics had a significantly lower level of education, older age at menarche, less breast biopsies and biopsies with atypia and less likely to have a mother, sister or daughter with a BRCA mutation or history of breast or ovarian cancer in a 1st or 2nd degree relative compared to non-Hispanic whites ($p < 0.01$). Hispanics had a 5% elevated 5-yr Gail score compared to 34% of non-Hispanic whites. Those with an elevated Gail score were more likely to have reported Jewish ancestry have a higher educational level a history of breast biopsy and atypia or a history of a 1st or 2nd degree relative with breast cancer and were less likely to be married. Discussion: Breast cancer risk factors and Gail scores differed significantly between Hispanics and non-Hispanic whites. Recognition of racial disparities is critical for implementing a personalized breast cancer screening and prevention program in the community. This suggests that in Hispanics, screening and prevention should target obesity reduction, while greater reduction in non-Hispanic whites may be achieved through genetic counseling.

Keywords: breast cancer; risk assessment; racial disparities; Gail scores

Poster #: 30

Breath Gases as Biomarkers in Cystic Fibrosis

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Long-term microbial infections in the lungs of Cystic Fibrosis (CF) patients are complex, individual, and difficult to correlate with patient condition or response to treatment. Gasses found in the breath of CF patients may enable detection of the presence of specific microbial metabolism. Our goal is to find molecules in breath samples that are specific to CF polymicrobial infections. Microbial and viral metagenomes along with transcriptomes from 6 CF patients at 2-4 timepoints each were sequenced from induced sputum samples. Using the Gas Chromatography and Mass Spectrometry methods established in the Rowland-Blake lab at UCI, we have analyzed triplicate breath samples from a CF patient and gender matched healthy control in a longitudinal study including seven approximately monthly timepoints. We also conducted a cross-sectional study of seven CF patients thought to possess distinct microbial profiles according to clinical culture data. We find elevated levels of 2,3-butanedione in 5 of 7 CF patients compared to the healthy controls during clinically stable periods, but not in the samples taken during i.v. antibiotic treatment. 2,3-butanedione is a toxic fermentation product specific to a subset of bacteria during low pH, low O₂ conditions. We find hits to *Streptococcus* spp. genes involved in 2,3-butanedione metabolism and catabolism. Observation of elevated 2,3-butanedione in the breath of CF patients is evidence for active *Streptococcus* spp. metabolism in the lung, as opposed to the mouth, where both healthy and CF patients harbor *Streptococcus* spp as part of the oral community. Volatile molecules detected in the breath of patients with lung infections including CF may enable taxonomic identification of the microbes driving the infection, and also indicate their active metabolism. Earlier and more specific diagnosis and treatment of periods of worsening symptoms known as exacerbations in CF may be possible using breath tests.

Keywords: metabolomics; breath gas; metagenomics; polymicrobial; Cystic Fibrosis

Poster #: 31

CANINE-ASSISTED INTERVENTION FOR CHILDREN WITH ADHD: PRELIMINARY FINDINGS FROM PROJECT POSITIVE ASSERTIVE COOPERATIVE KIDS (P.A.C.K.)

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Growing interest in the physical and psychological health benefits associated with human-animal interactions (HAI), and in particular, therapeutic canine-assisted intervention (CAI) programs, calls for systematic empirical evaluation of these interventions. Project Positive Assertive Cooperative Kids (P.A.C.K.), an ongoing randomized intervention study, was developed to examine the additive role of a CAI integrated in a 12-week cognitive-behavioral treatment (CBT) for children with ADHD and their parents. Utilizing a multimodal treatment approach including children's social skills training combined with behavioral parent training, two treatment groups (with versus without CAI) were compared in the current preliminary study. Participants included 24 children (83% male) ages 7-9 years ($M=7.90$, $SD=.76$) with ADHD, combined type, and their parents. Eligibility was confirmed via clinician interviews, parent and teacher rating scales, and child interview. All children half of whom underwent a waitlist control period) were randomly assigned to either a group CBT combined with CAI or a standard group CBT without CAI. Parents of children in both groups simultaneously participated in parent group therapy sessions. Parents completed questionnaires assessing children's social competence and problematic behaviors prior to and following treatment. Children's ADHD symptom severity, as reported by parents, was repeatedly assessed during treatment. Results from multilevel model analyses indicated notable improvements in children's social skills, prosocial behaviors, and a decrease in problematic behaviors across both treatment groups. While ADHD symptoms severity was reduced over time during treatment in both groups, children who received the CBT enhanced with CAI exhibited greater improvements than did children who received the CBT without CAI. Findings suggest that CAI offers a novel therapeutic strategy that may enhance cognitive-behavioral interventions for children with

Keywords: ADHD; Cognitive Behavioral Therapy; Human Animal Interaction; Canine Assisted Intervention; Behavioral Parent Training

Poster #: 32

Caregivers' perception of infant physical activity in premature babies-Pilot testing a new survey tool

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Background: Infants who receive adequate physical stimulation tend to roll over, crawl and walk earlier than infants who do not. Regular physical activity (PA) promotes the development of muscle mass and bone strength in healthy children and in children with chronic disease and disability. Despite the clear health benefits that accompany optimal PA early in life, qualitative work in this and other laboratories indicates that caregivers of prematurely born babies may view their babies as fragile, a perception that could inhibit the implementation of interventions designed to optimize PA early in life. Objective: To pilot test a quantitative survey of caregivers' attitudes towards PA—the Perceptions of Pediatric Activity Scale (PPAS)—and to compare the PPAS between mothers of infants in the Neonatal Intensive Care Unit (NICU) and mothers of older, healthy infants. Methods: The PPAS was distributed to mothers in childcare facilities ($n=75$, predominantly full term pregnancies) and in NICUs ($n=75$, prematurely born). The questionnaire was developed from qualitative interviews with mothers of premature infants. It included 48 items in which participants were asked how strongly they agreed or disagreed with statements about infant physical activity. The mothers surveyed reported diverse racial/ethnic, socioeconomic, educational and family backgrounds. Results: Factor analysis identified two subscales: 1) Benefits of and 2) Barriers to PA. Both subscales had strong internal consistencies (Cronbach's $\alpha > 0.85$). After correcting for socio-economic factors, significant differences in the Barriers subscale between childcare and NICU recruited participants ($p < .01$) were found. Barriers included the perception that an infant is too fragile for PA, PA will make an infant sick, and encouraging PA takes too much time. Differences between the two groups on the Benefits subscale approached significance ($p = .067$). Benefits included the perception that PA improves an infant's overall body functioning, muscle strength and is good entertainment. Discussion: The PPAS may be useful in predicting a mother's willingness to implementing infant PA programs and/or recommendations and tailoring interventions to meet her needs and concerns. A revised, shortened instrument is currently being piloted in a group of mothers enrolled in a study assessing benefits of a yearlong physical activity intervention program in premature infants.

Keywords: Infant Exercise; Maternal Perceptions; Physical Activity; Quantitative Survey; Prematurity

Poster #: 33

Chronic pain leads to disruption of mesolimbic dopamine function in response to opioids

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Opioids are among the most potent analgesics available and are the cornerstone for severe acute and chronic cancer pain management. However, the use of opioids for the treatment of non-cancer chronic pain is significantly less effective for reasons that remain unknown. In addition to their powerful analgesic properties, opioids also possess incentive-motivational properties that contribute to their pain relieving attributes. Alterations in the affective-reward system in a chronic pain state are a logical hypothesis for their sub-optimal analgesic effects in treating neuropathic pain. In this study, we examine how the reinforcing properties of opioids change in a chronic pain state. We use an animal model of chronic pain whereby the left sciatic nerve was loosely constricted with a polyethylene cuff, a chronic constriction injury (CCI). The reinforcing properties of opioids were then tested using the conditioned place preference test (CPP). CCI led to significant microglial activation in the ventral tegmental area (VTA), the brain region containing the dopaminergic cell bodies of the mesolimbic system. Microglial activation was correlated with significant increase in expression of BDNF, and blocking microglial activation reversed BDNF levels to normal levels. CCI also led to significant dysregulation of chloride homeostasis in GABAergic interneurons of the VTA, an effect that could be reversed by a TrkB antagonist. Under basal conditions, morphine place preference was similar in both sham and neuropathic animals. However, concomitant treatment with a dopamine antagonist blocked morphine CPP in neuropathic, but not sham animals. Dopamine antagonism also blocked morphine analgesia in neuropathic, but not sham animals. These results point to a significant dysregulation in reward systems of the brain in chronic pain conditions, mediated by activated microglia. It suggests analgesia, rather than the inherent rewarding properties of opioids may be driving morphine motiv

Keywords: neuropathic pain; opioid; dopamine; reward; ventral tegmental area

Poster #: 34

COLORECTAL FELLOWSHIP PROGRAMS IN THE UNITED STATES: HOW ARE WE DOING?

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Background: Little is known about the outcomes of colorectal surgery in hospitals with an ACGME accredited colon and rectal surgery residency program (CRP). Methods: Using the Nationwide Inpatient Sample 2009-2010, we identified hospitals with a colorectal residency program using their associated AHA codes and retrospectively reviewed all cases performed for colon and rectal cancer, polyps, diverticular disease, crohns and ulcerative colitis, and ischemic colitis. Patient demographics were listed and outcomes were compared to other hospitals on multivariate regression analysis. Results: A total of 36,538 cases were identified and 6,971 (19.56%) were performed in hospitals with a CRP. Compared to other hospitals, those with a CRP performed more cases for rectal cancer (16.88% vs. 8.91%; $p < 0.001$) and inflammatory bowel disease (14.83% vs. 3.87%; $p < 0.001$). CRP hospitals tended to operate less frequently for diverticular disease (27.13% vs. 38.91%; $p < 0.001$). On multivariate analysis, cases operated in CRPs had longer length of hospital stay by 0.90 day ($p < 0.001$), and higher hospital charges by 16,505 US\$ ($p < 0.001$). However, patients operated in CRPs were more likely to have a procedure performed laparoscopically (aOR=1.35; $p < 0.001$), with lower rates of conversion (aOR=0.97; $p = 0.002$) and had lower complication rates (aOR=0.94; $p < 0.05$). No difference in mortality was observed. Conclusion: Despite higher hospital charges and a slightly longer length of stay, hospitals with colorectal residency programs had better outcomes in terms of lower conversion rates and lower morbidity and used minimally invasive technology more frequently.

Keywords: colorectal; fellowship; ACGME; CRP; surgery

Poster #: 35

Comparison of Automated vs Manual Determination of the Respiratory Variations in the EKG Waveform Recordings

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In general anesthesia, it has become increasingly popular to monitor respiratory induced variations in hemodynamic variables and use such analysis to predict fluid responsiveness in patients. A currently well-accepted dynamic fluid responsiveness predictor is Pulse Pressure Variation (PPV). However, PPV assessment requires the placement of an invasive arterial line. In past studies, respiratory variation in the EKG lead II R-wave amplitude has been shown to correlate with PPV and has been shown to be a potential predictor of volume status in mechanically ventilated patients (Figure 1). The aim of this study was to assess the accuracy of a computer-automated algorithm compared to manual measurements made in identifying EKGv R wave variability (EKGv). Twenty four distinct data batches of digitalized EKG waveforms were collected at 800 samples/second during ongoing moderate risk surgical cases. EKGv for each batch was then measured manually and then by the automated algorithm for R wave heights relative to the trough of the isoelectric waveform of standard lead II (RDii). Manual measurements were done on three successive respiratory cycles for each data batch and the EKGv's calculated were then averaged for comparative analysis. EKGv's calculated by the automated algorithm for the same data batch were also averaged for comparative analysis. Manual and automated EKGv determinations were then compared using liner regression and Bland-Altman analyses to determine accuracy. A linear regression comparing the manual EKGv's to the automated algorithm showed a significant relationship between manual and automated EKGv ($R^2 = 0.98$; $p < 0.001$) and a Bland-Altman analysis also showed a strong agreement between both EKGv. The bias for the automated algorithm was 0.17 with 95% confidence intervals of $\pm 1.77\%$. Initial analysis of EKGv data indicates a significant relationship and a strong agreement the manual calculation and the automated algorithm.

Keywords: EKGv; respiratory variations; fluid responsiveness; Lead II; algorithm

Poster #: 36

COMPARISON OF RADIOFREQUENCY ABLATION VS. CRYOABLATION FOR ATRIOVENTRICULAR NODAL REENTRANT TACHYCARDIA IN PEDIATRICS

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Introduction: In this study, we sought to compare the success rates of radiofrequency ablation (RF) vs. cryoablation (cryo) in eliminating AVNRT in the pediatric setting. "Success" was defined as complete elimination of AVNRT without any reoccurrence of documented tachycardia. **Methods:** Ninety-two patients with the diagnosis of AVNRT who underwent catheter ablation from 2006-2013 were retrospectively analyzed and divided into two groups: RF and cryo. The RF group consisted of 56 patients (mean age 13.73 +/- 3.35 years; 53% female) and the cryo group 40 patients (mean age 13.27 +/- 3.32 years; 45% female). Reoccurrence rates were then documented for all patients following their initial procedure. Average follow up time for RF was 2.35 +/- 1.76 years and 3.07 +/- 1.58 years for Cryo. **Results:** Eleven patients had a reoccurrence of their tachycardia (four after RF and seven after cryo). The time from date of procedure to initial reoccurrence was 7.03 +/- 7.94 months for RF and 4.46 +/- 2.83 months for cryo ($p = ns$). Procedural times (136.38 +/- 55.29 minutes for RF vs. 144.5 +/- 51.87 minutes for cryo) as well as fluoroscopy times (11.86 +/- 9.52 minutes for RF vs. 10.4 +/- 6.62 minutes for cryo) were not statistically significant between the two groups. Long term success rate was 92.85% for RF and 82.50% for cryo ($p = 0.0416$). Permanent AV block did not occur for any patient in either group. **Conclusion:** Both RF and cryo are safe treatment options for AVNRT in pediatrics. However, RF appears to have higher long-term success rates when compared to cryoablation.

Keywords: Ablation; Catheter; Radiofrequency; Cryoablation; Pediatrics

Poster #: 37

Computer Guided Reactivation of p53 Cancer Mutants

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The tumor suppressor p53 is the most frequently mutated gene in human cancer. Reactivation of mutant p53 by small molecules is an exciting potential cancer therapy. Although several compounds restore wild-type function to mutant p53, their binding sites and mechanisms of action are elusive. Second site point mutations in p53 also can reactivate many clinically important p53 cancer mutants in vivo. Here we used a combined computational and biological approach to design an effective platform for the prediction, identification, and optimization of p53 cancer mutant reactivation. Our discovery strategy is guided by state-of-the-art machine learning, genetic mutation analysis, molecular dynamics simulations, solvent fragment mapping, and in silico docking. Ensemble-based docking is emerging as a new paradigm in virtual screening and drug discovery. High throughput genomic methods validate the efficacy of these drug leads in cells. We first demonstrated that a structural change from drug binding and a structural change from a genetic mutation can be processed equivalently by our computational predictor, so we are able to use p53 genetic mutation data to make predictions about prototype p53 rescue drugs. Moreover, ensemble-based virtual screening against a newly revealed pocket selects stictic acid and few other compounds as a potential p53 reactivation. Collectively, the biological and computational experiments suggested a few potential p53 reactivation regions on the surface of the protein as promising drug targets. These results provide the basis and tools for the development and improvement of potential cancer therapeutics that function through reactivation of p53 cancer mutants.

Keywords: p53; machine learning; drug discovery; cancer

Poster #: 38

Construct Validity of a Cost-effective Assessment of Orthopaedic Surgical Skills via the Fundamentals of Orthopaedic Surgery (FORS)

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Objectives: Psychomotor testing has been recently incorporated into residency training for general surgery through The Fundamentals of Laparoscopic Surgery (FLS) program. The FLS protocol serves as a cost-effective training and assessment tool during residency, and is now required for board certification in general surgery. To date, orthopaedic surgery does not have a comparable psychomotor assessment tool. The purpose of this study was to develop and validate a cost-effective psychomotor training and assessment tool — The Fundamentals of Orthopaedic Surgery (FORS) — for orthopaedic surgery resident education. **Methods:** An orthopaedic skills board was made from supplies purchased at a local hardware store with total costs less than \$350 to assess six different psychomotor skills. The six skills include fracture reduction, 3D drill-accuracy, simulated fluoroscopy guided drill accuracy, depth-of-plunge-minimization, drill-by-feel accuracy, and suture speed and quality. Twenty 3rd and 4th year medical students and thirteen fellowship-trained orthopaedic surgeons were tested on each of the six drills. Time to perform the tasks was measured for all drills with accuracy measurements for all skills except fracture reduction and suturing. Statistical analysis was done with an unpaired t-test with significance set at $p < 0.05$. **Results:** The attending surgeons significantly outperformed the medical students in all 6 of the tasks ($p < 0.05$). This difference in performance was most pronounced for the fracture reduction, depth-of-plunge-minimization, and suturing tasks ($p < 0.0001$), while showing a less pronounced yet statistically significant difference in the remaining three drills ($p < 0.05$). **Discussion:** The Fundamentals of Orthopaedic Surgery testing system has established construct validity, i.e. being able to discriminate between the novice and the expert technician. Future studies to demonstrate longitudinal improvement and operating room predictive success are warranted.

Keywords: Orthopaedic Surgery; Resident Education; Surgical Simulation

Poster #: 39

CORTICAL INTERHEMISPHERIC CONNECTIVITY AND SPECTRAL POWER IN RELATION TO BEHAVIORAL DEFICIT IN ACUTE ISCHEMIC STROKE

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Measures of brain function provide insight into pathophysiology underlying neurological deficits, but the most commonly used methods (fMRI, PET) are expensive and difficult to implement in acutely ill patients. The current study is the first we know of which utilizes 256-channel dense-array electroencephalography (dEEG) at the patient bedside in the acute phase of stroke (1-6d) to measure cortical network dynamics. Here we address the hypothesis that the degree of behavioral deficits are related to extent of reduction in ipsilesional primary motor cortex (M1) interhemispheric connectivity with contralesional M1 and (2) quantitative EEG changes. Scalp potentials were collected from 23 patients with acute ischemic stroke and 12 age-matched healthy controls, using dEEG, during rest and during 0.14Hz wrist flexion. The dEEG metrics extracted were (1) coherence, reflecting network connectivity, in α and β frequency bands and (2) power, reflecting cortical activity. Interhemispheric coherence at rest correlated significantly ($r = -0.57$, p -value=0.0053) with NIHSS, a global measure of deficits, and with Box & Blocks score ($r = 0.52$, p -value=0.028), a measure of arm function. Decreased grip strength correlated with increase of low frequency power relative to high frequency power of ipsilesional M1 ($r = -0.55$, p -value=0.01), contralesional M1 ($r = 0.5$, p -value=0.029), and ipsilesional parietal ($r = -0.58$, p -value=0.009) regions at rest and contralesional M1 during movement ($r = -0.54$, p -value= 0.025). Results suggest that reduction of interhemispheric motor network connectivity and cortical activity of primary cortices are each associated greater motor deficits, a finding that is concordant with resting state functional MRI studies. These dEEG measures may have utility to inform therapeutic decision-making.

Keywords: stroke; EEG; connectivity; neuroimaging; brain repair

Poster #: 40

Deep Tissue Imaging for Cancer Detection Using FLIM

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We have developed a new fluorescence confocal microscope called the DIVER (Deep Imaging via Enhanced-Photon Recovery) with unprecedented capabilities for deep tissue fluorescence imaging. Our microscope uses 2-photon excitation to image at 3-4 mm in tissues by virtue of a unique detector design that has very large collection efficiency compared to conventional confocal microscopes. To increase the contrast between different cells and tissues we developed the large area detector for fluorescence lifetime imaging microscopy (FLIM). The combination of deep tissue imaging and fluorescence lifetime provides contrasted images based on physiological parameters at a depth that was not considered possible before our development. The Diver can be used to image several parts of the human body, in particular for skin cancer providing 3D cellular resolved images. We will present the principle of operation of the microscope and show images obtained in unstained tissues in the liver, kidney and lungs of mice.

Keywords: Microscopy; Tissue imaging; Fluorescence Lifetime; Metabolism; Cancer

Poster #: 41

DESERT HEDGEHOG DEFICIENCY ACCENTUATES PERIPHERAL NERVE DEMYELINATION

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Hypothesis: Defining the molecular mechanisms underlying chronic compressive neuropathies (CNC) is crucial for identifying novel treatment methods. Recent advancements have prompted a reinterpretation of compressive neuropathies as a form of chronic neural wound healing producing a fibroproliferative response from both Schwann cells and fibroblasts. Desert hedgehog (dhh) is a Schwann cell produced protein responsible for formation of nerve perineurium. We hypothesize that it is a potential therapeutic target, given its interaction with extracellular matrix and connective tissue. Methods: An in-vivo murine model of CNC injury was created with 3mm tube placed atraumatically around sciatic nerve of six-week old dhh^{-/-} mice. Electrophysiology was performed bi-weekly. IHC was performed for select connective tissue proteins. A Mann-Whitney test was performed with p-value < 0.05 constituting significance. Results: Nerve conduction velocities (NCV) showed a marked rapid decline in dhh^{-/-} compared to wildtype mice. NCV declined from 52.15±0.5 m/s at baseline to 15.06±0.578 m/s at 2 weeks, and slight improvement at 4 and 6 weeks to 25.63±1.514 m/s and 26.13±1.21 m/s, respectively. Wildtype animals show the slowest NCV at 6 weeks and never reach equivalent slowing seen in dhh^{-/-}. Immunohistochemical stains for collagen IV, laminin-2, and fibronectin showed abnormally profuse scarring in dhh^{-/-} at 2 weeks, compared to wildtypes. Summary: CNC injuries can be characterized by a progressive decline in nerve conduction velocity. In dhh knockout mice, NCV shows a more rapid and severe decline compared to wildtype animals, signifying a vital role for the desert hedgehog protein in propagation of nerve impulses. These data support the central role of Schwann cells inducing CNC injuries and suggests a possible neuroprotective role of desert hedgehog as it seems to accentuate peripheral nerve demyelination.

Keywords: compression; nerve injury; schwann cell

Poster #: 42

Developing Ergonomic Training Materials for Vietnamese Supermarket Workers with a Community Participatory Approach

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Asian American population has grown rapidly in the past two decades in Orange County, with 57% increase between 1990 and 2000, and an additional 42% increase between 2000 and 2010. As a result, supermarkets serving these populations have assumed a larger share of the local commerce. These supermarket workers are exposed to various ergonomic risk factors that lead to injuries while injury prevention materials in Asian languages are rarely available. The goal of this project is to develop and pilot test of culturally and linguistically appropriate ergonomic training materials for Vietnamese grocery store workers. This project is guided with a community participatory approach that is aimed at developing the training materials not for the workers but with the workers. The two partners of this project are UCI Center for Occupational and Environmental Health (COEH) and Orange County Asian and Pacific Islander Community Alliance (OCAPICA). This partnership has been indispensable for implementation of the project. This project has also been nurtured by the community research environment created by the UCI Institute for Clinical Translational Sciences. For example, the County Health Care Agency – Network for a Healthy California - Orange County Region Worksite Program and community participatory research workshops have also provided guidance to overcome to barriers to carry out this project. These barriers include: a) Workplace injury prevention programs being treated as low priorities by the ethnic supermarket owners, b) owners confuse occupational health researchers with occupational safety and health regulatory professionals, and workers may be reluctant to communicate with researchers for fear of being penalized by management. A needs assessment survey with the workers and managers was conducted and the goal was to understand the demographic characteristics of worker and the preferred content, formats and languages for the training. A new understanding of the workers was gained through this approach: not all the workers were Vietnamese in a Vietnamese supermarket (90% Vietnamese workers and 10% Latino workers). Preferred languages of the injury prevention training were: Vietnamese, Spanish and English. A set of new ergonomic training materials were identified to reflect workers' demographic characteristics. What originally planned to translate from English to Vietnamese was the Guidelines for Retail Grocery Stores: Ergonomics for the Prevention of Musculoskeletal Disorders (Cal/OSHA, 2003b; OSHA, 2004).

Keywords: Community Participatory Approach; Vietnamese; Injury prevention; Training

Poster #: 43

DEVELOPMENT AND ASSESSMENT OF A NOVEL PERIOPERATIVE ULTRASOUND CURRICULUM FOR ANESTHESIOLOGY RESIDENTS

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Introduction: Clinical decision-making can be greatly improved with point-of-care (POC) ultrasonography for the assessment of volume status, mechanisms of hypotension, and cardiopulmonary function. The focus of this Foundation for Anesthesia Education and Research (FAER) sponsored study was two-fold: (1) to design and introduce the concept of a comprehensive whole-body perioperative ultrasound exam (F.O.R.E.S.I.G.H.T.: Focused periOperative Risk Evaluation Sonography Involving Gastro-abdominal Hemodynamic and Transthoracic ultrasound) and (2) to assess the efficacy of learning this curriculum, via a model-based lecture series, by comparing pre- and post-training period test scores. **Methods:** The subjects consisted of anesthesiology residents at University of California, Irvine Medical Center. Residents received weekly lectures, which focused on a model-based technique for a period of six months that covered the comprehensive whole-body F.O.R.E.S.I.G.H.T. exam (Figure 1). Data points included one pre-lecture and four post-lecture multiple-choice tests. To assess the perceptions of the quality of the lectures, the participants also completed a follow-up survey. **Results:** Twenty-nine residents completed the study. Significantly higher scores were observed on all post-lecture multiple choice test scores (Physics Post vs Pre: $72 \pm 14\%$ vs $59 \pm 15\%$, $p = 0.002$, Volume Status/Mechanisms of Hypotension: $74 \pm 15\%$ vs $55 \pm 9.8\%$, $p < 0.001$, Pulmonary: $69 \pm 17\%$ vs $36 \pm 15\%$, $p < 0.001$, Cardiac: $64 \pm 15\%$ vs $45 \pm 12\%$, $p < 0.001$) when compared to pre-lecture multiple choice exams (Figure 2). Follow-up resident surveys showed a high level of satisfaction and interest at $89 \pm 7\%$ (Figure 3). **Conclusion:** This study introduced the concept of a comprehensive POC perioperative ultrasound examination for resident anesthesiologists. The results suggest improved resident learning and a promising beginning to a curriculum that may play an instrumental role in the advancement of anesthesiology resident education.

Keywords: Curriculum; Ultrasound; Anesthesiology; Residents; Perioperative

Poster #: 44

DIFFERENCES IN POSTOPERATIVE BEHAVIORAL CHANGES IN HISPANIC AND WHITE CHILDREN

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Background: Studies of postoperative recovery have begun to incorporate a wide range of variables in addition to pain. One widely studied area is behavioral changes after surgery, with research indicating that the overwhelming majority of children exhibit new onset negative behavioral changes following surgery. However, extant literature has relied on relatively homogenous populations and has not considered differences in behavioral recovery of children as a function of cultural factors, such as ethnicity and language. Accordingly, the purpose of this study was to investigate whether children's post-operative negative behavioral changes may systematically vary among Spanish- and English-speaking White and Hispanic families. **Methods:** A total of 288 parents of children undergoing outpatient elective surgery at CHOC Children's Hospital participated in the study. Eligible children had no developmental delays, were not born premature, and were Anesthesiology Society of America (ASA) status I or II. Parents completed demographic information on the day of surgery and recorded pain and behavioral changes on postoperative days 1, 3, and 7. Parents were grouped into English-speaking Hispanic ($n = 92$), Spanish-speaking Hispanic ($n = 72$), and English-speaking White ($n = 42$). **Results:** The majority of children exhibited new onset negative behavioral changes postoperatively. However, after controlling for demographic differences and pain severity, group differences in the PHBQ emerged. Specifically, Spanish-speaking Hispanic parents reported significantly lower overall negative behavioral changes (51%) compared to both English-speaking Hispanic (71%) and English-speaking White (83%) and lower rates of general anxiety ($p < .001$), apathy/withdrawal ($p < .001$), and eating disturbances ($p < .001$). **Conclusion:** Results of the present study suggest that parent perceptions of children's behavioral changes after surgery are influenced by ethnicity and language. Previous research has highlighted the cultural value of stoicism in Hispanic families, which may be reflected in the current findings. Moreover, the present results contribute to a growing body that highlights the need for culturally sensitive assessment and care of families in the medical setting.

Keywords: ethnicity; postoperative; surgery; pain; language

Poster #: 45

Differential Alternative Splicing of VEGF in Human Placenta of Normal and Preeclamptic Pregnancies

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Introduction: Alternative splicing at a distal site in the terminal exon 8 of VEGF gene produce novel VEGF isoforms (VEGF_{xxx}b) that translate proteins of the same length as the normal VEGF isoforms, but with different sequence and anti-angiogenic properties. However, whether these alternative VEGF splice variants are differentially expressed in preeclampsia is not fully understood. **Objectives:** To evaluate the differential expression of VEGF mRNA splicing variants in human placentas of various phenotypes of preeclampsia in comparison to normotensive controls. **Methods:** Placentas from normotensive deliveries (n=10/ group), severe preeclampsia (n=5-10/group) of early-onset, preeclampsia with chronic hypertension, IUGR or preterm birth, and paired controls were obtained via caesarean section. The placental samples were snap-frozen and total RNA was extracted using Trizol reagent. RNA (2 ug/sample) was reversed transcribed for PCR amplification of normal VEGF variants with a forward primer (exon 4, 5'-GAGATGAGCTTCCTACAGCAC-3') and a reverse primer (exon 8a, 5'-CTCACCGCCTCGGCTTGTCAC-3). VEGF_{xxx}b variants were amplified with the same forward primer and a reverse primer (8b, 5'-TCAGTCTTTCTGGTGAGAGATCTGCA-3). The amplicons were analyzed by agarose gel electrophoresis and sequencing. Placental protein was extracted for analyzing VEGF165 and VEGF165b by immunoblotting with specific antibodies. **Results:** Five VEGF amplicons (346 bp, 295 bp, 188 bp, and 91 bp) amplified with the exon 8a primer were detected in both normal and preeclamptic placentas, and the levels of VEGF165 mRNA and protein were found to be increased in preeclamptic placentas. The VEGF165b mRNAs was detected in both normal and preeclamptic placentas. Preeclamptic samples had greater mRNA expression of all isoforms. VEGF121b was detected in both populations equally. **Conclusion:** alternative VEGF splicing is a crucial mechanism for placental angiogenesis which may be deranged in preeclampsia.

Keywords: No

Poster #: 46

EFFECTIVENESS OF MATERNAL AND INFANT HOME VISITATION MODELS ON BIRTH OUTCOMES: A PRELIMINARY ANALYSIS OF MOMS ORANGE COUNTY DATA

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Purpose: The purpose of this research was to provide preliminary evidence about the effectiveness of the MOMS Orange County (MOMS) home visit program on birth outcomes. **Methods:** This study implemented an academic and community partnership approach. MOMS provided a de-identified dataset. This dataset included 2,028 pregnant women who enrolled in the MOMS program during 2009-2010. Paraprofessionals at MOMS collected the self-reported perinatal data and birth outcomes while conducting home visits. UCI's Program in Nursing Science was responsible for conducting multiple and logistic regression analyses to examine the associations between the number of MOMS prenatal home visits and birth outcomes, controlling for the covariates. **Results:** Pregnant women received the MOMS home visiting program were deemed high risk for negative birth outcomes based upon psychosocial factors: 44% of mothers in the program did not have a high school diploma, compared to the countywide average of 16.6%; and 77% of pregnant women in the program come from Latino ethnic background. However, women in the MOMS program have better birth outcomes compared to the county averages. In 2010, 5.5% of MOMS babies were born prematurely compared to 9.1% of babies born prematurely countywide. Results also show that the number of prenatal MOMS home visits significantly predicts birth weight, gestational age at birth, and the probability of newborn admission to the NICU. Every prenatal visit is associated with 62 grams of increase in birth weight, with .38 weeks of increase in gestational age at birth, and with 27% reduction in the odds of spending at least one day in the NICU. **Conclusion:** The MOMS health coordination model, in which highly trained paraprofessionals conduct home visits under close supervision of registered nurses, contributes to positive birth outcomes in high-risk population by decreasing preterm and low birth weight births and also decreasing the odds of newborn admission to the NICU.

Keywords: home visitation; birth outcomes; health disparity

Poster #: 47

Effects of Children's Temperament on Analgesics Administered by Parents After Surgery.

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Temperament, defined as behavioral style, can influence children's response to adverse events, and may affect both their perception of and response to pain. Previous studies have explored the influences temperament has on pain management, documenting that children with more active, outgoing temperaments report higher levels of pain and receive more analgesics. However, the relationship between children's temperament and parental administration of pain medication in the home setting has been largely neglected. Accordingly, the purpose of this study was to expand upon previous findings by focusing on analgesic administration by parents after outpatient surgery. A total of 273 parents of children ages 0-12 undergoing surgery participated in this study. Parents answered questions regarding their children's temperament preceding their child's surgery, and reported their child's pain intensity and amount of analgesics administered (non-opioid and opioid) on days 1, 3 and 7 after surgery. All analgesic doses were converted to mg/kg. Bivariate correlations revealed no significant associations between medication dosages and children's activity or sociability. Acetaminophen dosage was significantly associated with emotionality ($r(162) = 0.20, p = .01$) and shyness ($r(161) = 0.18, p = .02$), and ibuprofen was significantly associated with emotionality ($r(125) = 0.20, p = .02$). Hierarchical linear regression models controlling for pain severity indicated that emotionality was a significant independent predictor of acetaminophen administered at the trend level ($\beta = .146, p = .10$). Children's temperament, specifically emotionality and shyness, may influence postoperative pain management by parents, suggesting that parents are responding to children's behavioral style in addition to pain severity when deciding to administer analgesics at home.

Keywords: pain; pediatric; postoperative; temperament; analgesia

Poster #: 48

EFFECTS OF MARIJUANA USE ON COGNITIVE PERFORMANCE AND BRAIN ACTIVITY IN YOUNG ADULTS WITH AND WITHOUT ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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OBJECTIVE Attention-Deficit/Hyperactivity Disorder (ADHD) is a commonly diagnosed disorder that is characterized by inattention, hyperactivity, and impulsivity. Individuals with ADHD frequently use marijuana, a drug that has been shown to reduce attention and cognitive functioning in the general population. However, little is known about the effects of marijuana on young adults with ADHD. The aim of this study was to close this knowledge gap by examining the effects of marijuana use on brain activity and performance during mental arithmetic in users and non-users, with and without ADHD. **METHODS** Brain activity was studied using a Phillips Achieva 3T MR system in 32 young adults between the ages of 21 and 26 years (7 ADHD users, 7 ADHD non-users, 9 Control users, 9 Control non-users). Participants answered a set of math questions in the fMRI scan. The level of math difficulty was individualized based on a pre-scan test. Brain images were analyzed using SPM8 ANOVA full factorial design. **RESULTS** There were no significant differences in math performance between the four groups. However, there were significant differences in brain activity between users and non-users independent of ADHD diagnosis. More specifically, ADHD and control users showed activation in the superior frontal gyrus. ADHD and control non-users showed activation in the lingual gyrus. **DISCUSSION** The results suggest that marijuana users independent of ADHD diagnosis are less efficient in their prefrontal cortex activation during mental arithmetic compared to non-users. The non-users show more activation in the occipital lobe suggesting increased visual focus and processing.

Keywords: Marijuana; Cognitive Performance; Brain activity

Poster #: 49

Effects of region-specific neural stem cell therapy on corresponding behavioral outcomes

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Alzheimer's disease (AD) is characterized by many key pathological changes, including A β plaques, aggregated tau tangles, and global apoptosis. Additionally, behavioral identifiers include deficits in spatial memory and loss of olfactory function. Previously, hippocampal injected neural stem cells derived from adult mice have been shown to recover spatial memory in Tg2576 transgenic animals via localized BDNF signaling. However, the regional specificity of this effect is unknown. To test the stem cell rescue effect, GFP containing murine neural stem cells were stereotaxically inserted into transgenic and wildtype aged mice. Bilateral injections were made into the two brain regions associated with adult neurogenesis, hippocampus (CA1) and subventricular zone (SVZ). Subsequently, memory was assessed using both a spatial (MWM) and odor identification task. The results showed a recovery of both the spatial and olfactory memory tasks in the CA1 injected group, but an olfactory only recovery in the SVZ group. Our data suggest that, depending on the site of injection, stem cell therapies can act either globally or regionally. This implies that a therapy can be developed which will maximize the effect of neural stem cells depending on injection site.

Keywords: stem cells; Alzheimer's disease; neurotrophins; stereotaxic surgery; hippocampus

Poster #: 50

Effects of School-Based Taekwondo Training on Executive Function and Health Outcomes: The Healthy for Life Pilot Taekwondo Study

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There is growing consensus that exercise improves cognitive functioning, but research is needed to identify exercise interventions that optimize effects on cognition. The objective of this pilot study was to evaluate Taekwondo implemented in public middle school physical education (PE). Two classes were randomly assigned to either: five sessions per week of PE or three sessions of PE and two sessions of Taekwondo. In PE sessions, evidence-based curriculum to address the Presidential Core Fitness Guidelines and California Physical Fitness Tests was implemented. Taekwondo sessions included traditional techniques and forms taught in an environment emphasizing respect and self-control. Sixty students were evaluated at baseline and during the last week of the intervention (nine months later). Differences in mean residualized change scores for parent-rated inhibitory behavioral control yielded a significant, large effect size ($d = .95$, $p = .00$), reflecting greater improvement among Taekwondo students. Results from an executive function computer-administered task revealed greater accuracy on the congruent trial ($d = 2.00$, $p = .02$) for Taekwondo students. Differences in mean residualized change scores for BMI z scores yielded a moderate, non-significant effect size ($d = -.51$, $p = .16$). The majority of Taekwondo students reported positive perceptions of Taekwondo and perceived self-improvement in self-control and physical fitness. Results suggest that Taekwondo is an exercise program that improves cognitive functioning and is both feasible and acceptable to implement in a public school setting.

Keywords: exercise; cognitive function; community based research; physical education; school intervention

Poster #: 51

Electroacupuncture Activated Pathway from Caudal Ventrolateral Medulla to Rostral Ventrolateral Medulla

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Our previous studies have shown that electroacupuncture (EA) at the Jianshi-Neiguan acupoints (P5-P6, overlying the median nerve) attenuates sympathoexcitatory responses through inhibition of neuronal activity in the rostral ventrolateral medulla (rVLM). The caudal ventrolateral medulla (cVLM) modulates rVLM sympathetic nerve activity. However, there is no information on activation of cVLM neurons by somatic nerve activation during EA at P5-P6 acupoints, which can directly influence the rVLM. Thus, the present study evaluated EA-induced activation of cVLM neurons and their direct projections to the rVLM. Seven to ten days after unilateral microinjection of 100 nl of 0.04 μ m rodamine-conjugated microspheres into the rVLM, rats were subjected to 30 min of EA or control (needle placement without electrical stimulation) at P5-P6 acupoints applied bilaterally. Perikarya containing the microsphere tracer were identified in the cVLM of both groups. Compared to four controls, immunoreactivity of c-Fos, an immediate early gene and neurons double-labeled with c-Fos and the tracer were significantly increased in the cVLM rostro-caudally (Bregma, -13.32 to -14.16 mm; both $P < 0.05$) in six EA-treated rats, compared to controls. Separately, we noted EA activated neurons co-labeled with GAD67 mRNA that were detected with in situ hybridization and c-Fos protein in the cVLM in two EA-treated rats more commonly than in two controls. These results suggest that EA at P5-P6 acupoints activates cVLM GABAergic neurons. EA-activated cVLM neurons frequently project directly to the rVLM, which is known to participate in EA-modulation of sympathetic activity (supported by NIH grants HL-72125 and HL-63313).

Keywords: Acupuncture; Brain stem; c-Fos; Neuropathway; Cardiovascular regulation

Poster #: 52

EMERGENCY DEPARTMENT VS. RADIOLOGY DEPARTMENT PELVICE ULTRASOUND AND EFFECT ON PATIENT LENGTH OF STAY: A RANDOMIZED CONTROL TRIAL

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Intro: Although imaging studies are integral in diagnosing many patients presenting to the emergency department (ED), they often substantially extend patient length of stay (LOS). Bedside ultrasound performed by emergency physicians may yield many benefits including improved patient wait times and decreased overall LOS in the ED. We hypothesize there will be a significant decrease in the time to obtain an ultrasound image and an overall decreased LOS for patients who receive emergency department pelvic ultrasound (EDUS) compared to those that receive a radiology department pelvic ultrasound (RDUS). Methods: This is a prospective randomized clinical trial for 330 patients presenting to the ED requiring pelvic ultrasound imaging. Consented patients are randomized to EDUS on even days and RDUS on odd days. Time taken to obtain the ultrasound and total time spent in the ED are measured for each patient. Results: Fifty-four patients have been enrolled in the study from which 26 have been randomized to EDUS and 28 have been randomized to RDUS. The average time to perform pelvic ultrasound in the ED was 5.8 minutes while the average time to obtain pelvic ultrasound through radiology was significantly longer at 76.4 minutes ($p < 0.0001$). The average total time patients spent in the ED for EDUS was 219 minutes while the average total time patients spent in the ED for RDUS was significantly longer at 314 minutes ($p = 0.02$). Conclusions: Preliminary results show a statistically significant reduction in both time to obtain pelvic ultrasounds and total time spent in the emergency department for EDUS compared to RDUS. These initial results suggest that pelvic ultrasound performed at bedside by Emergency Physicians could positively impact patient care by reducing time to diagnosis, patient wait time and length of stay in the ED.

Keywords: Pelvic; Ultrasound; Emergency department; Radiology; Length of stay

Poster #: 53

ENHANCED COMA RECOVERY AFTER CARDIAC ARREST IN A RAT MODEL USING OREXIN-A

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INTRODUCTION: Resuscitation after cardiac arrest (CA) often leads to coma, with essentially no treatment. A potential target for improving post-CA coma is the hypothalamic orexin pathway. We monitored brain electrophysiology and behavior while determining the benefit of orexin-A on arousal after CA in a rat model. We hypothesized that post-resuscitation, orexin-A intracerebroventricular (icv) infusion after bolus injection provides immediate and long term arousal benefit as assessed by quantitative EEG (qEEG) and behavioral testing (neurologic deficit scale; NDS). **METHODS:** We implanted 17 adult male Wistar Rats with an icv cannula and osmotic pump one week before 7 minute-asphyxial cardiac arrest. Rats were randomized 45 minutes after resuscitation to either orexin-A (n=8) or saline (n=9). EEG was monitored for 4 hours after CA, and for 30 minutes at 24/48/72hrs, & 12 days post-CA. NDS was also conducted at these times. We tracked qEEG using a previously validated measure of entropy, information quantity (IQ) and assessed brain histopathological damage score (HDS) via quantitative microscopy. **RESULTS:** Orexin-A led to higher normalized IQ immediately after injection in comparison to saline (0.73 ± 0.03 vs. 0.61 ± 0.02 ; $p<0.01$). This acute improvement in IQ sustained for 4hrs Post-CA, with band-specific analysis showing an improved IQ at 72hrs in β & γ -band. Behaviorally, orexin-A rats performed better on the NDS at 4hrs (38.3 ± 3.2 vs. 30.1 ± 1.9 ; $p<0.05$); 24hrs (67.1 ± 4.1 vs. 49.8 ± 3.8 ; $p<0.01$); 48hrs (73.4 ± 4.3 vs. 61.0 ± 3.6 ; $p<0.05$), and 72hrs (75.0 ± 3.3 vs. 65.2 ± 2.9 ; $p<0.05$). Brain histology demonstrated no significant difference in ischemic damage in cortex or CA1 between groups. **CONCLUSION:** Post-CA, rats receiving icv orexin-A demonstrated significant improvements in arousal on both qEEG and behavioral (NDS) testing, despite no significant change in ischemic neuronal injury. Orexin-A may have therapeutic potential for usage in disorders of arousal and coma after CA.

Keywords: orexin; cardiac arrest; coma; intensive care; hypoxia

Poster #: 54

ENHANCED HEPCIDIN EXPRESSION IN THE RAT PROXIMAL DUODENUM AND THE ROLE OF IRON IN EXPERIMENTAL DUODENAL ULCERATION

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We recently demonstrated that an increased duodenal iron concentration potentiates carrier-mediated uptake of the duodenal ulcerogen cysteamine, creating conditions favorable to oxidative stress reactions (Arch Biochem Biophys 2012;525:60-70). We hypothesized that an enhanced proximal duodenal iron concentration during ulcer formation may affect hepcidin expression as a regulator of duodenal iron absorption. Sprague-Dawley rats were gavaged with water or cysteamine-HCl (25 mg/100g x 3 at 4 h intervals) and euthanized 0.5, 2, 6, 12, or 24 h later. The expression of hepcidin, IL-6, IL-1a and BMP6 in duodenum was measured by real-time PCR. Western blot assays were used for detection of SMAD5, and phosphorylated SMAD1,5,8. IL-6 in serum was quantified by ELISA. The level of hepcidin mRNA in control rat duodenum was low but cysteamine administration at 2, 12 and 24 h markedly increased hepcidin mRNA expression by 6.3-, 11.9- and 43.3-fold, respectively. IL-6 mRNA was not detectable in rat duodenal mucosa up to 12 h after cysteamine treatment but was markedly elevated at 24 h. IL-1a mRNA expression was almost undetectable in control duodenum but was elevated after cysteamine administration to 7.5-, 45- and 169-fold at 2, 12 and 24 h, respectively. Cysteamine did not affect duodenal BMP6 mRNA expression. Western blot assays demonstrated that cysteamine administration elevated SMAD5 protein levels and induced phosphorylation of SMAD proteins in the rat proximal duodenum in a time-dependent manner. Our results demonstrate hepcidin expression in rat proximal duodenal enterocytes induced by the duodenal ulcerogen cysteamine, with involvement of STAT3 phosphorylation (demonstrated previously, Gastroenterology 2009;136:A23) and activation of BMP signaling through the SMAD1/5/8 pathway. These molecular changes appear to represent newly-discovered mechanisms of tissue-specific injury involving regulation of duodenal iron transport by hepcidin and leading to duodenal ulceration.

Keywords: Hepcidin; Iron; Duodenal ulceration; Cysteamine

Poster #: 55

ENHANCING ULTRASOUND EDUCATION THROUGH VOLUNTEER PARTICIPATION IN CARDIAC SCREENING

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Objective: To develop medical student sonography skills through volunteer involvement in a cardiac screening on local athletes for hypertrophic cardiomyopathy. **Methods:** University of California, Irvine medical students were recruited and trained to obtain cardiac ultrasound images to detect hypertrophic cardiomyopathy (HCM) in local high school athletes. HCM ultrasound training involved watching an instructional video and up to two hours of supervised, hands-on ultrasound use. Students had unlimited access to an ultrasound machine for non-supervised practice. Ten Orange County, California high schools or junior colleges hosted the ultrasound cardiac screening team of 5-12 medical students and 1-3 supervising physicians as part of student athlete physical events. An average of 150 student athletes were scanned during each 4-hour screening. For each athlete, a medical student obtained 2-second video-clips of parasternal long and parasternal short cardiac views. From the parasternal short view, apical to the mitral valve, the muscular ventricular septum and the left ventricular wall were monitored in motion mode (m-mode) and were measured in systole and diastole on a still m-mode image. The recorded ultrasound videos and images were reviewed by a pediatric cardiologist after the screening. Medical students were asked to complete a brief survey about their participation. **Results:** Twenty-five medical student volunteers and five physicians obtained cardiac ultrasound data for more than 1500 young athletes in Orange County, CA over a four month period. Incidence of findings is pending final review by the research team pediatric cardiologist, who determined 67-74% of student-performed cardiac scans adequate for HCM assessment. Students reported increased confidence in obtaining specific cardiac views quickly, utilizing extensive features of the ultrasound machine, and teaching the screening process to other students. **Conclusion:** Student participation in public ultrasound screening provides a public service and enhances student skills and confidence.

Keywords: ultrasound; hypertrophic cardiomyopathy; sudden cardiac death

Poster #: 56

EVALUATING THE ACCURACY AND PRECISION OF THE MASIMO LABS/MASIMO CORPORATION PULSE CO-OXIMETER HEMOGLOBIN MONITOR

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Blood hemoglobin concentration (Hgb) is one of the most common and valuable blood indices used for assessing well-being and the need for blood transfusion during the intraoperative period. Currently, Hgb is determined by analyzing blood gas samples obtained from an arterial or venous line. Disadvantages of this method include minor risk of infection, low update rate, delayed diagnosis, and cost. The Masimo Pulse CO-Oximeter Hemoglobin monitor (Masimo Corp., Irvine, CA) provides a solution to these disadvantages and will help reduce patient discomfort from invasive blood sampling, eliminate delay time for accurate results, and provide continuous Hgb reading. The objective of this prospective, clinical observational study is to detect patient Hgb changes using Masimo Labs' non-invasive hemoglobin device and compare the results against gold standard blood sample analysis obtained from laboratory results. Currently, data is being collected in the Main Operating Room of the UCI Medical Center through a sampling of surgical patients with high expected blood loss who are receiving arterial lines. Researchers are collecting the following data: patient demographics, periodic blood samples, oxygen saturation, surgical procedure, surgical position, ASA classification, and finger diameter. Thus far, 18 patients have been enrolled in the study and research processes are still ongoing; no adverse events have occurred. All data is currently being analyzed in a proprietary stage. When recruitment increases, there are chances of collaborating with Masimo Labs to analyze data for publication in the future. If the accuracy and precision of the Masimo Pulse CO-Oximeter Hemoglobin monitor are confirmed, there can potentially be a great improvement to patient care during the perioperative period.

Keywords: blood; hemoglobin; monitoring; noninvasive

Poster #: 57

EVALUATING THE IMPACT OF THE CLINIC IN THE PARK: A COMMUNITY BASED OUTREACH PROGRAM

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UCI, Public Health UCI, Emergency Medicine UCI, Pediatrics

Intro: Clinic in the Park is a community-based model of health promotion and disease prevention/disease prevention. The Clinic Collaborative, is 30 community non-profit organizations, public and academic institutions, and foundations and individuals providing monthly services at the OC Great Park Farmers Market. Purpose: The purpose of the program is to test pilot a model of multidisciplinary health promotion and disease and injury prevention services in a non-traditional public venue. The Clinic is designed to 1) Connect children to services; 2) Provide on-site safety net health screenings, immunizations and medical services; 3) Build health promotion skills and provide tools. This study was designed to determine the needs and acceptability of a clinic in the park. Methods: The Clinic “stations” were 1) Health Services & Enrollment; 2) Health Screenings; 3) Keep Kids Safe. The following tools were developed: 1) collaborator evaluation; 2) visitor evaluation; 3) people counters at the entrances and each station; and 3) family “passport” for zip code, ages and record of stations visited. Results: Between June 2012 and April 2013 over 5,181 visitors attended from 24 Orange County zip codes and were provided over 10,820 services. Specific screening services included: oral exams/fluoride treatment, hearing and speech, BMI measurement, individual and group health chats. Qualitative visitor and collaborator surveys demonstrated the need for services especially for underserved populations. It also revealed the need to provide transportation for families from outlying communities. Conclusion: The Clinic in the Park model for using public spaces for health has potential to connect families to services, provide safety net services, and enhance what can be provided in a medical home. The Clinic appears to be a reliable and trusted source for no-cost health and health promotion. We plan to develop the research agenda for evaluating the impact of the Clinic in the Park model.

Keywords: Clinic; Community; Outreach; Wellness; Public Health

Poster #: 58

EXERCISE AND A HIGHER FAT DIET MAY INFLUENCE THE PHYSICAL HEALTH OF INDIVIDUALS WITH VCP INCLUSION BODY MYOPATHY WITH PAGET DISEASE AND FRONTOTEMPORAL DEMENTIA

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Inclusion body myopathy with early-onset Paget disease and frontotemporal dementia (IBMPFD) is a rare autosomal dominant genetic disease caused by a mutation on the Valosin-containing protein (VCP/p97). The Kimonis lab has discovered that heterozygous pregnant mice fed a higher fat diet have homozygous VCPR155H/R155H offspring that live up to 10 months opposed to only 21 days with a normal fat diet. Positive findings are also present in the lab with mice that run uphill on a treadmill. Our hypothesis was that if affected IBMPFD individuals exercise or have a high fat diet are physically healthier and have a better overall quality of life, then they will result in higher scores in the physical health domain and the Quality of Life Questionnaire (QoL). The QoL queries all the symptoms of IBMPFD along with questions about diet and exercise. We focused on the physical health domain component of the QoL. We found a higher mean physical health domain score for exercise ($p=.028408$) and higher fat and sugar intake ($p=.011604$) in comparison to the group who did not exercise and had a low fat and sugar intake with the study consisting of 28 individuals. This helps support that exercise and a higher fat diet increases an affected individual's physical health. Our next step is to analyze if an increased fat intake is causing the slowed progression of symptoms since it could not be differentiated from the sugar intake in this study. There are currently no treatments for myopathy or dementia so it is advantageous to determine the lifestyle choices that can improve health.

Keywords: Diet; Nutrition; Exercise; Inclusion body myopathy; Quality of life

Poster #: 59

Femtosecond Laser "Mini-Bubble" Deep Lamellar Dissection for DALK and DSAEK

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Purpose: To better define the parameters of femtosecond laser deep anterior lamellar dissection that result in a smooth bed for either deep anterior lamellar keratoplasty (DALK) or for preparation of donor material in thin stroma descemet stripping automated endothelial keratoplasty (DSAEK)

Methods: 10 fresh human corneal scleral donors were mounted on artificial anterior chambers and exposed to femtosecond laser dissections 30-50 microns anterior to Descemet membrane using an iFS 150 kHz laser Abstract Central - Abstract Proof 12/4/12 9:32 PM <http://arvo2013.abstractcentral.com/abstract> Page 2 of 3 to femtosecond laser dissections 30-50 microns anterior to Descemet membrane using an iFS 150 kHz laser (Abbott Medical Optics, Santa Ana, CA). Variables studied were spot separation, pattern of laser scanning, and pulse energy. Key outcomes were 1) ease of tissue separation; 2) gross inspection of the tissue bed; 3) spectral domain optical coherence tomography (OCT); and 4) trypan blue/alizarin red staining of the endothelium. Results: Separation of the tissue plane was easiest with a combination of close spot separation (4x4 microns) and high pulse energy (3.6 microjoules). The smoothest bed was obtained with wide pulse spacing (8x8 microns); low pulse energy just higher than threshold (0.45 to 0.6 microjoules) and 8 alternating raster and spiral passes, rotated 45 degrees between each pair of passes. OCT revealed stromal separation either at or slightly anterior to Descemet membrane. Staining showed no evidence of endothelial injury. Conclusions: Wide pulse spacing and very low pulse energy delivered in multiple passes results in a smoother stromal plane in the deep cornea, compared to tight spot spacing and higher pulse energy levels. This "mini-bubble" technique may be useful in both DALK and in donor tissue preparation for DSAEK. (No Image Selected)

Keywords: 578 laser; 741 transplantation; 479 cornea: clinical science

Poster #: 60

GENOMIC STUDIES IN AUTISM: CLUES TO PATHWAYS AND THERAPIES

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Objectives: determine if genome analysis provides insight into underlying disease mechanisms in autism. **Methods:** We carried out studies at the level of chromosome segments and gene analysis in 60 patients with autism and exome sequencing in 6 patients. **Results** Microarray analysis and fluorescence in situ hybridization studies of chromosomes revealed the presence of copy number variants that involved neurotransmitter receptor genes in 5 patients. We identified duplication that involved GABA neurotransmitter receptor genes GABRG, GABRB3 and GABRA5 on chromosome 15q13.2 in 3 patients. One patient had a deletion that encompassed the nicotinic acid receptor gene CHRNA7 on 15q13.4. One patient had a deletion that encompassed the glycine neurotransmitter receptor genes GLRA3 and GLRB on chromosome 4q34. Our Exome sequencing studies revealed a non-synonymous rare coding mutation in the glycine receptor gene GLRA4 on the X chromosome in twins with autism. Our microarray studies on two siblings with autism revealed the presence of a deletion on chromosome 12p that encompasses the calcium ion channel gene CACNA1C. This ion channel gene has been reported to be mutated in other cases of autism. Autism occurs as one of the manifestations of Tuberous sclerosis that is due to mutations in either the TSC1 gene or the TSC2 genes. Using exome sequencing we demonstrated a deletion in the TSC2 gene that impacted a key functional domain in the tuberin protein. Products of these genes regulate the mTOR pathway to influence metabolism and cell proliferation at various sites. **Significance:** Relevance to potential therapies. Discovery of abnormalities in neurotransmitter receptor functions and identification of calcium ion channel defects hold promise for therapeutic approaches. Sato et al., (2012) reported that the mTOR inhibitor Rapamycin used in therapy of Tuberous sclerosis reversed impaired social interaction in mouse models of the tuberous sclerosis complex due to TSC2 mutation.

Keywords: autism; genome; variation; neurotransmitter; synapses

Poster #: 61

GEOGRAPHIC PREVALENCE OF TRAUMA MECHANISMS IN AN URBAN SETTING

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OBJECTIVE: The consequences of traumatic mechanism injuries remain a major public health problem in urban settings. National hospital-based statistics remain useful, however they do not provide insight into the mechanisms where the greatest burden for morbidity and mortality originates. Understanding of geographic variation in outcomes from these injuries would improve prevention. Our objective is to identify incidences and outcomes associated with severe traumatic injury across geographic regions of Orange County in order to target resources and injury prevention strategies. **METHODS:** The trauma registry at our Level I trauma center was retrospectively queried for all trauma patients admitted in 2010. Patient were categorized by the mechanism of injury, geolocated, and imported into a computerized map for analysis. Mechanism, transport time, lengths of stay, and outcomes were also evaluated. **RESULTS:** There were a total of 2481 patients, 464 (18.7%) were excluded due to 911 system inputting errors and outdated technology. Auto vs. Auto or Motorcycle traumas were unexpectedly prevalent on surface streets. There was a substantial prevalence of assaults along the freeways. About 38.7% of Auto vs. Pedestrian traumas occurred on major streets and intersections and penetration traumas (41.8%) in the large inner city areas. **CONCLUSION:** Our data illustrates the importance of focusing appropriate resources on the areas where certain mechanisms of traumas are concentrated in order to prevent future traumas from occurring. Furthermore, our analysis indicates that there is room for enhanced technologies to assist in achieving The Golden Hour ideal to improve trauma outcomes. New technologies, such as Next Gen 911 (assist in geolocation), voice, video, data and text transmission can significantly enhance decision-making abilities and quality of healthcare. With these enhancements in place, emergency responders would be better prepared and also arrive with quicker response times.

Keywords: Trauma; mechanisms; prevention

Poster #: 62

Glioma big potassium channel expression in human cancers and possible T cell epitopes for their immunotherapy.

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Big potassium (BK) ion channels have several spliced variants. One spliced variant initially described within human glioma cells is the glioma BK (gBK) channel. This isoform consists of 34 aa inserted into the intracellular region of the basic BK ion channel. PCR primers specific for this inserted region confirmed that human glioma cell lines and freshly resected surgical tissues from glioblastoma multiforme patients strongly expressed gBK mRNA. Normal human brain tissue very weakly expressed this transcript. An Ab specific for this gBK isoform confirmed that human glioma cells displayed this protein in the cell membrane, mitochondria, Golgi, and endoplasmic reticulum. Within the gBK region, two putative epitopes (gBK1 and gBK2) are predicted to bind to the HLA-A*0201 molecule. HLA-A*0201-restricted human CTLs were generated in vitro using gBK peptide-pulsed dendritic cells. Both gBK1 and gBK2 peptide-specific CTLs killed HLA-A2/gBK gliomas, but they failed to kill non-HLA-A2-expressing but gBK target cells in cytolytic assays. T2 cells loaded with exogenous gBK peptides, but not with the influenza M1 control peptide, were only killed by their respective CTLs. The gBK-specific CTLs also killed a variety of other HLA-A*0201 cancer cells that possess gBK, as well as HLA-A2 HEK cells transfected with the gBK gene. Of clinical relevance, we found that T cells derived from glioblastoma multiforme patients that were sensitized to the gBK peptide could also kill target cells expressing gBK. This study shows that peptides derived from cancer-associated ion channels may be useful targets for T cell-mediated immunotherapy.

Keywords: Glioma BK; Immunotherapy

Poster #: 63

GLOBAL GENE PROFILING IDENTIFIES DYSREGULATED PATHWAYS IN VCP-ASSOCIATED MYOPATHY

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Inclusion body myopathy associated with Paget's disease of bone and frontotemporal dementia (IBMPFD) is characterized clinically by adult onset of progressive proximal muscle weakness, Paget's disease of bone, frontotemporal dementia, and clinical evidence of motor neuron disease in approximately 10% of individuals. Patients may express only one or two phenotypic components and need not demonstrate all three phenotypic features. Pathology includes ubiquitin and TDP-43-positive inclusions also seen in Amyotrophic Lateral Sclerosis (ALS) and other proteinopathies. Valosin Containing Protein (VCP) is a key regulatory protein which is involved in a plethora of cellular functions and signaling transduction pathways. We have conducted a microarray profiling study examining the muscles from patients with VCP mutations versus their first degree unaffected and non-mutation carrying relatives. With this global analysis, we have elucidated several dysregulated transduction cascades and their signaling intermediates. Interestingly, the microarray results showed most significant changes in the regulation of actin cytoskeleton pathway; genes critically involved in cell communication, multiple structural and dynamic processes including maintenance of cell shape, cell replication, cell movement, cell signaling, cell differentiation, and apoptosis. These proteins are expressed in muscle and may be involved in attaching muscle tissue to the extracellular matrices. Thus, a dysregulation of these proteins may lead to aberrations in the cytoskeleton, thereby leading to weakness and muscle pathology, ultimately leading to myopathy. Further immunohistochemical analysis of IBMPFD patient fibroblasts depicted increased TDP-43 and Ubiquitin pathology as compared to controls. Seahorse analysis of IBMPFD patient fibroblasts depicted a decrease in oxygen consumption rates (OCR) when compared to normal fibroblasts. Dissecting the signaling intermediates of the actin cytoskeleton cascade will help in understanding the pathogenesis of VCP-associated disease and in the development of potential therapeutic targets in related progressive neurodegenerative diseases.

Keywords: Valosin Containing Protein; Inclusion Body Myopathy; Paget's Disease of Bone; Frontotemporal Dementia; Global Microarray Profiling

Poster #: 64

GOAL-DIRECTED FLUID MANAGEMENT BASED ON MONITORING OF PLETH VARIABILITY INDEX (PVI)

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Goal-directed fluid management has been shown to be effective in improving patient outcome. Currently accepted hemodynamic predictors of fluid responsiveness, however, are somewhat invasive. For example, Pulse Pressure Variation requires an arterial line. In response to this, a noninvasive device (Masimo Corp., Irvine, CA) exists that can measure respiratory variations in the plethysmographic waveform. This index is referred to as the Pleth Variability Index (PVI). PVI is calculated from the maximum and minimum plethysmographic waveform amplitudes over time. The aim of this study was to test whether PVI can be used to predict fluid responsiveness in goal directed fluid management and ultimately improve patient outcomes. Recruited patients were randomized into two groups: Control (C) and Goal Directed Fluid Optimization (GDFO). In the C group, anesthesiologists administered fluids based on whatever standard care procedures they preferred while in the GDFO group, anesthesiologists were asked to follow a protocol to maintain PVI under 15% by giving iterative colloid boluses of 200 ml over 15 minutes. Total colloids administered was higher in the GDFO group (n=89) than in the C group (n=92) (0 [0-0] mL vs 400 [0-550] mL). Total crystalloids administered (normalized to weight and length of intubation) was lower in the GDFO group than in the C group (7.27 [5.58-10.39] cc/kg/hr vs 5.92 [4.60-7.92] cc/kg/hr). The length of hospital stay was similar for both groups (2.0 [1-3.4] vs 2 [1-4.1]). Data collection is ongoing, but thus far results show that this GDFO protocol may be a feasible technique for standardizing fluid management.

Keywords: None

Poster #: 65

Going beyond the air leak test – Our initial experience with the use of a new grading system utilizing flexible endoscopy for the intraoperative evaluation of stapled rectal anastomoses.

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PURPOSE To develop and validate an intraoperative grading system utilizing flexible endoscopy to identify stapled rectal anastomoses at high risk for anastomotic leak (AL). **METHODS** This is a retrospective review of 51 patients who underwent stapled rectal anastomoses with intraoperative flexible endoscopy. A three-tiered grading system was developed to intraoperatively evaluate perfusion of the anastomoses based on the appearance of the mucosa around the circular staple line. Anastomotic leak was defined as the disruption in the staple line confirmed by either endoscopy or a contrast study within 60 days of surgery. Anastomoses where the mucosa appeared circumferentially normal around the staple line were labeled Grade 1. They were Grade 2 if 30% or less of the mucosa on one side of the staple line had evidence of vascular congestion or ischemia. Grade 3 anastomoses were those where 30% or more of the mucosa appeared congested or ischemic on one side of the staple line or where any degree of mucosal congestion or ischemia was present on both sides of the staple line. **RESULTS** Of the 51 patients studied, 42 (82%) were Grade 1, 7 were Grade 2 (13%), and 2 were Grade 3 (4%). The total leak rate for this series was 18%. 6 of the 42 patients (14%) with Grade 1 anastomoses leaked. 3 of these (7%) were symptomatic AL and managed by minor drainage procedures. AL in the remaining 3 patients were incidental findings. No intervention was performed, and they were followed until the AL resolved. Of the 7 patients with Grade 2 anastomoses, 3 (43%) experienced an AL. One needed percutaneous drainage, another required operative intervention, and the third patient was followed without intervention. Both Grade 3 anastomoses were taken down during the index surgery and reconstructed; neither developed a subsequent leak. We did not divert 6 high risk mid rectal anastomoses based upon the healthy endoscopic appearance of the mucosa. Only one of these patients experienced a symptomatic leak requiring transanal drainage. Overall, intraoperative flexible endoscopy led to a change in the operative plan in 8 patients (16%). **CONCLUSION** This study demonstrates that increasing grading severity correlates with an increased risk of AL. An endoscopic grading system, based on the appearance of the perianastomotic mucosa, may also help identify patients who benefit from diversion.

Keywords: rectal anastomoses; flexible endoscopy; intraoperative evaluation; colorectal surgery; grading system

Poster #: 66

HUMAN ES-DERIVED MOTOR NEURON PROGENITOR CELL IMPLANTATION IN CONUS MEDULLARIS / CAUDA EQUINA INJURY

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Background: About 20% of all traumatic spinal cord injuries result in a combined lesion to the sacral segments of the spinal cord (CM) and the lumbosacral nerve roots (CE). CM/CE injuries result in degeneration and death of motor and autonomic neurons in the spinal cord with resultant paralysis, sensory deficits, neuropathic pain as well as bladder, bowel, and sexual dysfunction. No successful treatments are currently available for patients with CM/CE injuries. **Approach:** We use human-derived cells (H1 and H9) in attempts to reverse neurological deficits after CM/CE injuries. Human embryonic stem (ES) cells were differentiated in vitro towards a motoneuron lineage. They were promoted to express the Hb9 transcription factor, a marker for motor neuron progenitor cells. These cells were injected acutely into the lumbosacral spinal cord of adult female Sprague-Dawley rats after a unilateral L5-S2 ventral root avulsion (VRA n=8) and after implantation of avulsed roots (VRI n=6). A separate group of animals were injected with media after VRA (Sham n=6). Animals were sacrificed one week after VRA to test for cell survival. **Results:** Transplanted cells were detected in the rat spinal cord using immunohistochemistry and initial quantitative assessments demonstrated cell survival. Spinal cord sections containing transplanted cells were immunoreacted with antibodies against Human Nuclear (HuNu) protein, which will label only transplanted cells, and showed an average of 97.95 (s.d. ±11.95) HuNu+ cells per section (n=2 rats). Additional sections are undergoing morphological analysis to compare cell survival between groups and to determine the proportion of glial and neuronal cells. **Conclusions:** Future goals include testing the ability of transplanted cells to survive, differentiate, and extend axons to the periphery via replanted ventral roots. Micturition behavior and urodynamic studies will determine whether functional micturition results from this cell-based intervention. If successful, our studies may result in a new treatment strategy to restore bladder function in subjects with CM/CE injuries, a vastly underserved patient population. **Grant support:** California Institute for Regenerative Medicine (CIRM, TR-01785) and the Adelson Medical Research Foundation (AMRF)

Keywords: ventral root avulsion; stem cell transplantation; cauda equina injury; conus medullaris injury

Poster #: 67

Human Myeloid-Derived Suppressor Cells Induced from Healthy Donor Peripheral Blood Mononuclear Cells After Co-Culture with Human Placental Cell Lines

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Introduction: The similarities between fetomaternal and tumor-associated immunologic tolerance suggest a possible common link. Myeloid-derived suppressor cells (MDSC) are a subset of innate immune cells that can alter adaptive immunity and produce immunosuppression in patients with cancer. Induction of MDSCs is a universal feature of all human cancers. Placental cell lines have not been included to date. This study examined the ability of human placental cell lines to induce MDSCs from healthy donor human peripheral blood mononuclear cells (PBMC).

Methods: Three choriocarcinoma cell lines (BEWO, JAR, and JEG-3), a first trimester placental cell line (HTR-8/SVneo), and a positive control (SCC-MT1) were used to induce MDSC from healthy donor PBMC using in vitro co-culture methods. A suppression assay was then performed and flow cytometry was used to measure their ability to inhibit T cell proliferation. All 5 cell lines were tested for both CD33+ and CD11b+ MDSC subsets and repeated with PBMCs from two different donors. The mean and SEM of each sample was analyzed by ANOVA followed by Dunnett's post-test for comparison to T cells only.

Results: All cell lines generated the CD11b+ MDSC subset with a significant frequency of induction of suppression. Significant induction of suppression was observed with the CD33+ subpopulation in only BEWO and JAR cell lines.

Conclusion: This study demonstrates the ability to induce both suppressive CD33+ and CD11b+ MDSC with human placental cell lines suggesting a possible novel mechanism for fetomaternal immunologic tolerance and a possible target for future studies of common placental-related obstetrical complications.

Keywords: MDSC; Myeloid; immunology; placenta

Poster #: 68

Human Retinal Progenitor Cells for Retinitis Pigmentosa

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Objectives: Retinitis pigmentosa (RP) is an incurable blinding disease that is genetic in nature and due to the sequential degeneration of rod and then cone photoreceptors. Although RP is rare, the onset is earlier and phenotype more severe than is the case in the more prevalent condition of age-related macular degeneration (AMD). The ultimate goal of this project is transplantation of allogeneic retinal progenitor cells (RPCs) of human fetal origin to the vitreal cavity of patients with RP in order to improve visual outcome.

Methods: Human donor tissue was obtained from an approved distributor under a GTP protocol and maternal blood was screened for adventitious agents. Human RPCs were expanded and banked under GMP conditions using serum-free, xeno-free media previously developed for CNS progenitors of this type. The resulting cellular product was subjected to a wide range of tests including sterility, karyotype analysis, marker expression, freeze-thaw viability, in vitro and in vivo tumorigenesis assays, biodistribution, and in vivo dose range studies. Proof-of-concept studies were performed in immunosuppressed RCS rats.

Results: hRPCs manufactured under GMP conditions met established phenotypic and safety criteria for cells of this type. The therapeutic mechanism of action of RPCs appears to involve trophic-mediated neuroprotection of host photoreceptors. Efficacy has been demonstrated in dystrophic RCS rats at the anatomical level, as well as behaviorally and electrophysiologically. The product has been designated as an orphan drug by the FDA for treatment of RP.

Discussion: There is much to recommend this approach, including simplicity, safety, and most of all the potential for a striking degree of stem cell-mediated efficacy in an untreatable blinding disease. Ongoing work is directed towards the completion of all IND-enabling preclinical studies and the initiation of clinical trials in RP.

Keywords: Retinal degeneration; Stem cell; Retinitis pigmentosa; Retinal progenitor cell; Transplantation

Poster #: 69

Impact of Inflammatory Biomarkers on Relation of High Density Lipoprotein-Cholesterol with Incident Coronary Heart Disease: Cardiovascular Health Study

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Objective: Investigate inflammatory markers' individual and collective impact on the association of HDL-C with incident coronary heart disease (CHD). **Background:** Inflammatory factors and low HDL-C relate to CHD risk, but whether inflammation attenuates any protective association of high HDL-C is unknown. **Methods:** In 3,888 older adults without known cardiovascular disease (CVD), we examined if the inflammatory markers C-reactive protein (CRP), interleukin-6 (IL-6), and lipoprotein-associated phospholipase A2 (Lp-PLA2) modify the relation of HDL-C with CHD. HDL-C was grouped as ≥ 60 (high), 40-59 (intermediate), and < 40 mg/dL (low), CRP as < 1 (low), 1-3 (intermediate), and ≥ 3 mg/L (high), and IL-6 and Lp-PLA2 as tertiles. Also, an inflammation index of z-score sums for CRP, IL-6, and Lp-PLA2 was categorized into tertiles. We calculated CHD incidence for each HDL-C/inflammation group and performed Cox regression, adjusted for standard CVD risk factors and triglycerides to examine the relationship of combined HDL-C-inflammation groups with incident events. **Results:** CHD incidence (per 1,000 person years) was higher for higher levels of CRP, IL-6, and the index, and lower for higher levels of HDL-C. Compared to high HDL-C/low-inflammation categories (referent), adjusted HRs for incident CHD were increased for those with high HDL-C and high CRP (HR=1.52, $p < 0.01$) or highest IL-6 tertile (HR=1.41, $p < 0.05$), but not with highest Lp-PLA2 tertile. Higher CHD incidence was similarly seen for those with intermediate or low HDL-C accompanied by high CRP, high IL-6, or a high inflammatory index. **Discussion:** The cardioprotective effect of high HDL-C for incident CHD appears to be attenuated by higher inflammation.

Keywords: High Density Lipoprotein; Coronary Heart Disease; Cardiovascular Disease

Poster #: 70

IMPORTANCE OF PARAVENTRICULAR NUCLEUS IN MODULATORY ACTIONS OF ACUPUNCTURE ON EXCITATORY CARDIOVASCULAR FUNCTION

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Paraventricular nucleus (PVN) in the hypothalamus regulates sympathetic outflow and blood pressure. Somatic afferent stimulation activates neurons in the PVN but little is known about its physiological actions in this nucleus and its regulation of neural activity. Parvocellular PVN neurons project directly to sympathoexcitatory cardiovascular regions of the rostral ventrolateral medulla (rVLM). Electroacupuncture (EA) stimulating specific somatic sensory nerves modulates sympathoexcitatory reflex responses including elevated blood pressure. We hypothesize that PVN and its projection to rVLM participate in the action of EA on sympathoexcitatory cardiovascular responses. Cats were anesthetized, ventilated, and heart rate and mean blood pressure were monitored. Application of bradykinin (BK, 10 μ g/ml) every 10 min on the gallbladder induced a consistent pressor reflex. Thirty min of bilateral EA stimulation at acupoints P5-6 reduced the pressor responses for a prolonged period of time i.e. for at least 60 min. Unilateral inhibition of the PVN with 50 nl of naloxone restored the change in blood pressure during BK-induced pressor responses, an effect that lasted for 20 min. Retrograde tracing from rVLM showed EA-related c-Fos PVN neurons juxtaposed to endorphinergic PVN fibers. Cardiovascular baro-sensitive PVN neurons with direct projection to rVLM decreased splanchnic evoked activity with 30 min EA. Responses of cardiovascular baro-sensitive sympathoexcitatory rVLM neurons with median nerve input paralleled the cardiovascular responses i.e. splanchnic nerve-evoked rVLM neuronal discharge was reduced by EA and then restored with 50 nl naloxone in the PVN. Thus, sympathoexcitatory PVN responses and PVN-rVLM pathway are important in processing the actions of acupuncture, a medical modality to modify hypertension.

Keywords: somatic nerve activation; electroacupuncture; elevated blood pressure; rostral ventrolateral medulla; gall bladder

Poster #: 71

Influenza mortality in the United States, 2009: Burden and timing

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Background/Objectives: In April 2009, the most recent pandemic of influenza A began. We present the first estimates of pandemic mortality based on the newly-released final data on deaths in 2009 and 2010 in the United States. **Methods** We obtained data on influenza and pneumonia deaths from the National Center for Health Statistics (NCHS). Age- and sex-specific death rates, and age-standardized death rates, were calculated. Using negative binomial Serfling-type methods, excess mortality was calculated separately by sex and age groups. **Results** In many age groups, observed pneumonia and influenza cause-specific mortality rates in October and November 2009 broke month-specific records since 1959 when the current series of detailed US mortality data began. Compared to the typical pattern of seasonal flu deaths, the 2009 pandemic age-specific mortality, as well as influenza-attributable (excess) mortality, skewed much younger. We estimate 2,634 excess pneumonia and influenza deaths in 2009–10; the excess death rate in 2009 was 0.79 per 100,000. **Conclusions** Pandemic influenza mortality skews younger than seasonal influenza. This can be explained by a protective effect due to antigenic cycling. When older cohorts have been previously exposed to a similar antigen, immune memory results in lower death rates at older ages. Age-targeted vaccination of younger people should be considered in future pandemics.

Keywords: Influenza; Pneumonia; Mortality; Disease Burden; Pandemic

Poster #: 72

Initial Outcomes of Femtosecond Laser-Assisted Zig-zag Configuration Deep Anterior Lamellar Keratoplasty

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Purpose: To report the early results of deep anterior lamellar keratoplasty (DALK) performed using the femtosecond laser with the zig-zag incision configuration. **Methods:** 28 consecutive eyes of 27 patients underwent femtosecond laser assisted DALK with zig-zag configuration. Clinical records were reviewed retrospectively. Corrected distance visual acuity (CDVA), manifest and topographic astigmatism, and complications were reviewed. **Results:** A big-bubble was successfully achieved in 24 eyes. Four eyes required dissection down to a very thin residual stromal bed. Postoperative follow-up ranged from 3 months (n=28) to 2.5 years (n=3). At post-operative month 3, mean CDVA was 20/30 (range 20/20-20/60), mean manifest astigmatism was 3.5 D (range 1.25-6 D), and mean topographic astigmatism was 4.23 D (range 1.1-9.25 D). These outcomes remained stable throughout the follow up period. Complications included suture revision at post-operative month 3 for wound gape in one patient. **Conclusions:** Visual outcomes of femtosecond laser-assisted zig-zag DALK are similar to our results with zig-zag full thickness penetrating keratoplasty. In addition, this technique offers a decreased risk of endothelial rejection in healthy eyes compared to penetrating keratoplasty.

Keywords: corneal transplantation; femtosecond laser; deep anterior lamellar keratoplasty

Poster #: 73

Intelligence Test Result Comparison between Prader Willi Syndrome (PWS) Patients Treated with or without Growth Hormone, and patients with Uniparental Disomy and Deletions

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Patients diagnosed with Prader-Willi Syndrome (PWS) have growth hormone deficiency and cognitive impairment. Although previous studies have shown a positive effect of early intervention with growth hormone (GH) treatment for patients with growth hormone deficiency, it is still unclear whether the treatment improves PWS patients' intelligence. Therefore, the aim of this project was to examine the influence of GH treatment on PWS patients' intelligence by comparing patients with and without GH, and patients with maternal uniparental disomy (UPD) and paternal deletions. I evaluated 78 individuals with PWS (56 from a previous cohort at UC Irvine (Cassidy) and 22 from the RCRDN UC Irvine cohort). To test the cognitive performance of PWS patients, 56 individuals were assessed with Stanford Binet and the other 22 individuals were with Kaufman Brief Intelligence Test (KBIT-2). In the RDCRN cohort patients with GH treatment had higher intelligence in comparison to those without GH (average IQ Composition score 67.82 and 61 respectively); however, the difference was not significant ($p=0.44$). The Cassidy cohort showed a significant result of higher intelligence with GH in the vocabulary section of the Stanford Binet test ($p=0.02$). Comparison between UPD and Deletion patients' intelligence revealed no significant difference in either cohort. This study shows that even with no significant difference between the GH treated and nonGH treated patients, there is a beneficial effect of treatment looking at the raw score of the intelligence test. Larger studies may determine if these trends turn out to be significant.

Keywords: Prader Willi Syndrome; Intelligence; Growth Hormone; Deletion; Uniparental Disomy

Poster #: 74

Isokinetic muscular contractions with blood flow restriction reduces oxygen extraction during moderate intensity fatiguing exercise in the vastus medialis oblique

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Blood flow restriction (BFR) exercise is a relatively new technique for permitting positive musculoskeletal changes utilizing lower intensity exercise and has yielded results similar to those achieved with higher intensity non-occluded resistance exercise. The mechanisms behind these positive changes have not been fully elucidated. It has been hypothesized that altered blood flow dynamics may impact fiber type recruitment and protein synthetic pathways. To date, most published research has been conducted on the vastus lateralis and biceps brachii muscles during isotonic contractions. The aim of this study was to examine blood flow dynamics in the vastus medialis oblique (VMO), a muscle that has been reported to be of specific importance to proper tracking of the patella, during isokinetic knee extensions with and without BFR. BFR was applied with an inflatable cuff placed on the proximal thigh which was maintained at 100 mm Hg during exercise. Exercise bouts consisted of 3 sets to volitional fatigue with a minute and a half rest between sets. BFR was maintained throughout the three sets and was released following completion of the final set. Near infrared spectroscopy using time resolved detection (TRS-20) was used to investigate muscle tissue blood flow dynamics. Exercise with BFR showed increased total hemoglobin levels during the exercise sets. Interestingly, this appears due to elevated oxyhemoglobin levels during the exercise sets with BFR rather than elevated deoxyhemoglobin levels which were not found to be significantly different. These results display altered blood flow dynamics that occur in the VMO during isokinetic exercise with BFR that may be related to positive changes that may occur with chronic training. Future research should look at the ability of this novel training method to be used for rehabilitation following knee injury as well as investigating the mechanisms associated with the positive outcomes.

Keywords: resistance training; hemoglobin; oxygen saturation; near infrared spectroscopy

Poster #: 75

LARGER CORTICAL ACTIVATION AFTER INCOMPLETE SPINAL CORD INJURY

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Brain function has been studied as a determinant of clinical status after spinal cord injury (SCI), and may be an important determinant of restorative therapies. Influences on the brain are of therefore of interest in this patient population. Previous studies have found that individuals with plegic lower extremities (ASIA Impairment Scale A/B) have reduced motor activity, but studies are needed of subjects who retain some persistence of voluntary leg movements. A total of 17 subjects with SCI were enrolled and had age >18 years, incomplete SCI (ASIA C or D), able to ambulate >10 meters with one person assistance or assistive device, and normal leg range of motion. Healthy age-matched controls (N=15) without SCI were also enrolled. Each underwent fMRI (3 Tesla) that alternated rest with 0.3 Hz right ankle dorsiflexion. Subjects with SCI were age 52.6 +/- 12.1 years (mean+/-SD), were 85.8+/- 84.0 months post-injury, neurological levels C1-L2, and were 3 ASIA C/17 ASIA D. Control subjects were age 49.9 +/- 18.6. Ankle movement was associated with activation of bilateral primary and secondary sensory and motor areas in both subject groups that was consistently larger among subjects with SCI. Direct comparison of the two groups (2-sample t-test, SPM8, p<0.01) was concordant, showing significantly greater activation in subjects with SCI in several regions of primary sensorimotor cortex of the right hemisphere. The results describe the cerebral response to generating efferent activity in the setting of injury to the caudal neuraxis. These findings suggest that cerebral events are a significant determinant of brain function in subjects with incomplete SCI, factors that might be important to developing and perhaps individualizing spinal cord rehabilitation interventions.

Keywords: spinal cord injury; MRI; cortical activation; rehabilitation

Poster #: 76

LIPID-ENRICHED DIET RESCUES LETHALITY AND SLOWS DOWN PROGRESSION IN A MURINE MODEL OF VCP-ASSOCIATED DISEASE.

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Valosin containing protein (VCP)-associated diseases, caused by mutations in the VCP gene, are a clinically and genetically heterogeneous group of disorders with manifestations varying from hereditary inclusion body myopathy, Paget's disease of bone, frontotemporal dementia (IBMPFD), amyotrophic lateral sclerosis (ALS), and other neurodegenerative diseases. Currently, there are no effective treatments for patients with VCP-related myopathies. VCP homozygous mouse models carrying the common R155H mutation develop a rapid and more severe muscle, brain and spinal cord pathology, with a lethal phenotype. Here, we report that feeding pregnant heterozygous VCPR155H/+ dams with a lipid-enriched diet (LED) results in the reversal of the lethal phenotype in homozygous offspring. The lipid-enriched diet regimen improved survival, motor activity, and myopathic and mitochondrial staining, and corrected autophagy flux previously known to be involved with VCP disease. A targeted lipidomic analysis of skeletal muscle and liver from homozygote animals on a LED revealed a reduction in tissue levels of non-esterified palmitic acid and ceramide (d18:1-16:0), two lipotoxic lipid substances. This work suggests that lipid supplementation may be a promising therapeutic strategy for patients with VCP-associated neurodegenerative diseases.

Keywords: VCP; IBMPFD; myopathy; diet modification; autophagy

Poster #: 77

LONG TERM IMPROVEMENT OF UROFLOWMETRY, AUA, AND QUALITY OF LIFE SCORES AFTER ROBOTIC ASSISTED RADICAL PROSTATECTOMY (RARP) PERSISTS AFTER 5 YEARS

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INTRODUCTION: No studies to date have documented long term changes in uroflowmetry and AUA symptom scores (AUAss) in patients after robotic assisted radical prostatectomy (RARP) for prostate cancer. This study investigates the impact removing the prostate has on AUA symptom score (AUAs), Bother score and uroflowmetry 5-10 years following RARP. **METHODS:** 86 of 670 men undergoing RARP by one surgeon (TA) had complete follow up (FU) including AUAs, Bother scores, uroflowmetry preOP and long term FU of 5.3 years. Men were asked to come to the clinic with a full bladder and Uroflowmetric PFR (Peak Flow Rates), PVR (Post Void Residual) and Voided volume (VV), were evaluated.

RESULTS: Average age at surgery was 60.8 and pad free continence at 5 years was 88%. Total AUAss for all men declined by 3.0 points while the bother score decreased by 0.6, all $p < .05$. Men with AUAs of 0-7 (Mild LUTS) experienced temporary increased AUA and Bother scores at 3M but were clinically unchanged at 5 years in respect to preop AUA scores. Men with preop AUAs of 8-35 (Moderate/Severe LUTS) markedly declined in AUA, PVR and Bother scores, all $p < .05$. At long term FU, Peak flow rates increased ~2 fold and PVR decreased ~3-4 fold.

CONCLUSIONS: At 5+ years men with preoperative Moderate/Severe AUAss had significant 2-fold PFR increases and Quality of Life improvements, marked 2-3 fold reductions in AUA scores and PVR, and stable volume capacities, all persisting years after RARP. Men with Mild AUAs returned to similar preoperative AUA and Bother scores but also had significant ~2-fold improved PFR. Long Term Increases in PFR were similar across all age cohorts. Men should be counseled that RARP may confer a very significant stable and long term benefit in men with AUA scores >7 , improving the Quality of Life in both urinary flow and symptoms.

Keywords: robotic assisted radical prostatectomy; Quality of Life; uroflowmetry; continence; AUA symptom score

Poster #: 78

LONGITUDINAL ASSOCIATIONS BETWEEN TELOMERE LENGTH, PSYCHOLOGICAL STRESS AND IMMUNE PROFILE IN CERVICAL CANCER SURVIVORSTucker, Jo A., PhD¹, Biegler, Kelly A, PhD^{1, 3}, Wenzel, Lari B., PhD^{1, 3, 5}, Kathryn Osann, PhD, MPH^{1, 5}; Susie Hsieh, PhD^{3, 5}; Amanda K. Laust, PhD¹; Edward L. Nelson, MD^{1, 2, 4, 5}Departments of ¹Medicine and ²Molecular Biology and Biochemistry, ³Health Policy Research Institute and Program in Public Health, ⁴Institute for Immunology, and ⁵Chao Family Comprehensive Cancer Center, University of California, Irvine

Objectives: Psychological stress is a major factor in suppression of immune function and has been associated with accelerated telomere shortening and decreased telomerase activity. Accelerated loss of telomeres can result in genomic instability: a hallmark of cancer. Cervical cancer survivors report high levels of stress and mood disorders compared to other gynecological cancers. In order to examine the effects of psychological stress on the immune system, we examined archived peripheral blood mononuclear cells (PBMC) from cervical cancer survivors, collected in a randomized study evaluating a Psychosocial Telephone Counseling intervention to improve quality of life and the stress response. **Methods:** Patient specimens and reported distress measurements were collected at baseline and four months after enrollment. Archived PBMC were evaluated for telomere length and any patients with changes in telomere length outside of the CV of 10% (n=17) were evaluated for associations between change in telomere length, psychological distress and immune profile. The Brief Symptom Inventory (BSI-18) score was used as a measure of psychological distress. Telomere length was analyzed by Flow-FISH, while immune profile refers to the IFN γ :IL-5 precursor frequency ratio as determined by ELISpot. Correlation analyses were controlled for age. **Results:** Significant correlations were observed between a longitudinal decrease in distress and increase in telomere length in total PBMC and T cells, but not B cells or monocytes. A decrease in distress also correlated with a shift from Th2 to Th1 cytokine production in T cells, and this Th1 shift positively correlated with telomere length. **Significance of Impact:** This study indicates that the reduction of psychological stress in cancer survivors leads to an increase in telomere length and a shift toward a Th1 profile in T cells; a more clinically beneficial phenotype.

Keywords: cancer; psychological stress; immune profile; telomere

Poster #: 79

MARIJUANA USERS ASSOCIATED WITH INATTENTION IN MEN AND SLEEP QUALITY IN WOMEN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

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OBJECTIVE The aim of the study was to explore gender differences in relation to marijuana use, ADHD symptoms, and sleep quality in individuals with ADHD. Based on previous studies, it was hypothesized that a greater frequency of marijuana use is associated with increased frequency of ADHD symptoms and decreased sleep quality. **METHODS** 56 men and 20 women with ADHD participated in the cross-sectional study and were assessed with the Assessment of Hyperactivity and Attention questionnaire, drug use survey, and Pittsburgh Sleep Quality Index. Pearson correlations were used to determine the association between marijuana use, ADHD symptoms in the AHA, and PSQI scores. **RESULTS** Men showed a significant correlation between marijuana use and increased ADHD symptoms ($r = 0.27$, $p = 0.045$), whereas women showed a significant correlation between marijuana use and decreased sleep quality ($r = 0.583$, $p = 0.007$). **DISCUSSION** The findings suggest possible gender differences in the association between marijuana use, ADHD symptoms, and sleep quality. Men and women may be using marijuana for different reasons, which include self-medicating to reduce ADHD symptoms and increase sleep quality, respectively. Thus, a greater understanding and further research on the association of marijuana use with ADHD symptoms and sleep quality is needed and may aid in the development of treatment interventions for marijuana abuse and dependence.

Keywords: Marijuana; Sleep; ADHD; Gender

Poster #: 80

Mechanisms of Neurotrophic Resistance in Alzheimer's Disease by the "IL-1 Effect" and Potential Restorative Therapies Using More Targeted Anti-Inflammatory Approaches

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One salient feature of Alzheimer disease (AD) is the disruption of synaptic plasticity contributing to the symptomatic cognitive deficits to learning and memory. Among the primary neuropathological lesions, pro-inflammatory cytokines are prevalent in the AD brain. Previous research has established that BDNF and its associated receptor, TrkB, act as integral components in many mechanisms linked to plasticity, learning and memory. We hypothesize that in AD, a possible mechanism by which these lesions can disrupt synaptic plasticity is by disrupting BDNF/TrkB endosomal trafficking, thus conferring a phenotype whereby neurons are not responsive to BDNF signaling. We further explored whether this effect is dependent on the pro-inflammatory cytokine, IL-1, (the IL-1 Effect). We have determined that chronic exposure to IL-1 does attenuate multiple outcomes of receptor endosomal trafficking. Further, this effect was not specific to TrkB, but rather affected numerous other receptors, suggesting that the mechanism of IL-1 signaling alters fundamental factors within the synapse that facilitate proper endosomal trafficking. Our data elucidates a novel fundamental mechanism of the deleterious effects of chronic or unregulated exposure to specific components in the inflammatory response in AD. Collectively, this implies that more selective anti-inflammatory therapies could be more beneficial in preventing deficiencies in neurotrophic factor signaling.

Keywords: BDNF; Alzheimer's Disease; Inflammation; Endosomal Trafficking

Poster #: 81

Modulation of opioid tolerance and hyperalgesia by ultra-low dose naloxone is independent of Toll-like receptor-4.

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Ultra-low doses (ULD) of the opioid receptor antagonist naloxone augment the analgesic actions of morphine, block the induction of tolerance, and reverse established tolerance by an unknown mechanism. Novel antagonism of Toll-like receptor 4 (TLR4) by the opioid receptor(OR)-inactive (+) stereoisomer of naloxone was reported and may be a potential mechanism by which ULD antagonists modulate opioid analgesia. Activation of glial TLR4 triggers spinal gliosis and the release of pro-nociceptive substances, which may contribute to the onset of analgesic tolerance and/or opioid-induced hyperalgesia (OIH). Thus, naloxone enantiomers were used to determine if ULD naloxone stereoselectively attenuates analgesic tolerance to chronic morphine and OIH via an OR-mediated mechanism. The involvement of TLR4 in acute morphine analgesia, tolerance to chronic morphine, and opioid-induced hyperalgesia, was also evaluated using genetically mutated mice (C3H/HeJ) in which TLR4 is non-functional. Acute morphine-induced analgesia was not augmented in the TLR4-mutant mice compared to wild type (C3H/HeOuJ) controls. Chronic morphine treatment (10mg/kg i.p., once daily) resulted in significant loss of analgesia after 5 days of treatment in both genotypes, indicating functional TLR4 was not required for the development of tolerance. Similarly, OIH was evident in both mouse genotypes following chronic administration of escalating doses (10-40mg/kg, i.p. BID) of morphine. The development of analgesic tolerance to chronic morphine was blocked by ULD (-)naloxone (1ng/kg, i.p.), but not (+)naloxone; however, both isomers blocked up-regulation of CD11b and glial fibrillary acid protein (GFAP) mRNA expression in the dorsal lumbar spinal cord. Interestingly, ULD naloxone non-stereoselectively blocked OIH induction in both TLR4-mutant and wild type mice. Therefore, attenuation of opioid tolerance by ULD naloxone occurs via an OR-mediated pathway, whereas inhibition of OIH by naloxone likely occurs vi

Keywords: opioid; tolerance; hyperalgesia; Toll-like receptor; ultralow dose

Poster #: 82

mTOR Signaling Modulates the Effects of Cytotoxic Chemotherapy on B-ALL Cells

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B-progenitor acute lymphocytic leukemia (B-ALL) is one of the most common malignancies in children. Fortunately, the current chemotherapeutics used to treat B-ALL are usually effective and can result in cures for 80% of pediatric patients. However, the current regimens are not as effective in high-risk patients like those with the Philadelphia chromosome (Ph+). Other high-risk subtypes that lack the Philadelphia chromosome also confer poor outcome and exhibit a “Ph-like” phenotype. These Ph-like ALL are similar to Ph+ ALL in their characteristic activation of pro-survival kinase pathways, including the PI3K/AKT/mTOR pathway. Thus, pharmacological targeting of the PI3K/AKT/mTOR pathway is a highly attractive strategy for treating these high risk B-ALL subgroups. Several small molecules have been developed to target various members of this pathway. These inhibitors are being tested as single agents and in combination treatments in various cancer types. In the case of B-ALL, new targeted agents are most likely going to be applied in combination therapy with standard treatments. The goal of this project is to assess how these inhibitors affect the cytotoxic killing of each standard chemotherapeutic agent. Interestingly, we have found that mTOR inhibition actually protects cells from many of the cytotoxic agents, even though each agent has different cellular targets. In contrast, inhibitors that target upstream PI3K and AKT were found to sensitize cells to chemotherapy. A novel BH3 profiling assay showed that mTOR inhibition does increase mitochondrial priming for death, suggesting another mechanism of cellular protection. Overall, these data suggest that agents targeting upstream PI3K and AKT might be more clinically beneficial than mTOR inhibitors when added to chemotherapy regimens for the treatment of B-ALL.

Keywords: mTOR; B-ALL; PI3K; combination therapy; chemotherapy

Poster #: 83

Neuronal differentiation of ASD specific fibroblast derived iPSCs to functional neurons and glia

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Autism Spectrum Disorders (ASDs) are the fastest growing developmental disorder in the United States and are, unfortunately, still poorly understood. A critical barrier in autism research is limited availability of statistically relevant numbers of patient-derived tissue samples, especially those of neural origin. Recent advances in the field of stem cell biology now make it possible to derive induced pluripotent stem cells (iPSCs) from patient-specific ASD cell lines. These can be used for a wide variety of studies from cellular analysis of disease mechanisms to screening for new therapeutics. Access to ASD patient cells lines, however, is still a limiting factor in the field. Here, we describe a newly established ASDs fibroblast and iPSC cell line resource. We currently have over 100 lines, available for request, derived from healthy and clinically-well-defined ASD-specific male patients and unaffected volunteers. A challenge in using iPSC disease models is to efficiently produce relevant differentiated and functional cell types for analysis. Using methods developed in our laboratory, we have confirmed, using a subset of the normal and ASD-specific iPSCs, that these cells can be differentiated toward a neural stem cell phenotype and terminally differentiated into action-potential firing neurons as well as glia. This represents a significant resource that will advance the use of ASD patient cells as disease models by the scientific community. A comparative analysis of these ASD-specific lines with unaffected controls will facilitate greater insight into the cause(s) and biology of the ASDs.

Keywords: Autism; iPSC; resource; neurons; glia

Poster #: 84

Niacin, an old drug with new therapeutic use for the treatment of non-alcoholic fatty liver disease (NAFLD)

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Objective/Specific Aims: NAFLD refers to a spectrum of liver damage ranging from simple fatty liver (hepatic steatosis) to a potentially progressive form, non-alcoholic steatohepatitis (NASH), which may lead to liver fibrosis, cirrhosis and end-stage liver disease. The prevalence of NAFLD is estimated at 30% of the general population, and affects up to 75% of patients with obesity and type 2 diabetes. Currently, there are no approved agents for the treatment of NAFLD. Based on our work demonstrating that niacin inhibits hepatic diacylglycerol acyltransferase-2 activity (DGAT-2, a key enzyme for triglyceride synthesis), we proposed the novel concept that niacin, through inhibiting triglyceride synthesis, decreases the accumulation of excess fat in liver and prevents the development of hepatic steatosis, key feature of NAFLD in humans. Using an established high-fat-induced animal model of NAFLD, this study examined the therapeutic role of niacin in the prevention and regression of hepatic steatosis. **Methods:** Rats were fed either a rodent normal chow, chow containing high-fat (HF), or HF containing 0.5% or 1% niacin in the diet for 4 weeks. For regression studies, rats were first fed HF diet for 6 weeks to induce hepatic steatosis, and then treated with niacin (0.5% in the diet) while continuing on HF diet for 6 weeks. Liver and serum lipid content, and liver oxidative products were measured. Liver histology was examined in hematoxylin and eosin (H&E) stained sections. **Results:** Feeding HF diet to rats significantly increased liver weight, fat content in liver and serum, and steatosis in H&E stained liver sections. Inclusion of niacin at 0.5% and 1% doses in HF diet significantly prevented liver and serum fat content, liver weight, hepatic oxidative products, and hepatic steatosis. Niacin treatment to rats with preexisting hepatic steatosis induced by HF diet significantly induced the regression of hepatic steatosis and triglyceride content in liver. **Discussion:** These novel findings suggest that niacin effectively prevents and induces the regression of experimental hepatic steatosis. Clinical development of niacin formulations and niacin-related compounds for the treatment of NAFLD will be important in addressing the unmet need for the development of therapeutic agents for NAFLD/NASH and other forms of fatty liver disease.

Keywords: Niacin; Non-alcoholic fatty liver disease; Non-alcoholic steatohepatitis; Fat; Steatosis

Poster #: 85

Nocturnal versus Daytime Pad Free Continence Following Robot Assisted Radical Prostatectomy (RARP) and Implications

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INTRODUCTION: Unlike nocturia, the nocturnal urge to urinate; nighttime urinary incontinence (UI) may reflect a relevant physiologic significance following RARP. This is the first review to analyze nighttime UI after RARP. **METHODS:** We queried 241 men undergoing RARP performed by one surgeon (Thomas Ahlering), 180 responded to self-reported questionnaires assessing time to day continence (DC) and night continence (NC). A subgroup of men were given medium-sized urinary pads and asked to separate them into day and night plastic bags at day 7 after catheter removal, and return them via overnight shipping. A subgroup of 20 men with prior TURP or bladder neck (BN) reconstructions was also analyzed. **RESULTS:** Group 1 had no history of bladder neck trauma, n=160, and Group 2 had prior TURP/BNR n=20. NC is achieved more quickly than DC; median time to NC was 7 days versus 42 days for DC. In the subgroup of 42 men returning pads, the median number of pads used and pad weight was 1.0 and 3.7 grams for nighttime versus 2.5 pads and 19 grams for daytime (p<0.01). Men with prior TURP/BNR have similar times to NC as non-reconstructed BN men. **CONCLUSIONS:** This study demonstrates that NC is achieved much faster than DC, and not impacted by a history of prior TURP or BN repair. In contrast to intestinal neobladders in which NC is very delayed and uncompleted, NC following RARP suggests a role of an autonomically-intact BN controlling NC.

Keywords: Robot Assisted Radical Prostatectomy (RARP); Nocturnal Urinary Incontinence; Urinary Continence; TURP; bladder neck

Poster #: 86

Opioids modulate cardiac spinal afferent responses to ischemia and other mediators

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Thinly myelinated Ad and unmyelinated C-fiber cardiac sympathetic (spinal) afferent nerve fibers are activated during myocardial ischemia. Although recent observations show that myocardial ischemia increases the concentrations of opioid peptides and that stimulation of peripheral opioid receptors inhibits chemical-induced visceral and somatic nociception, the role of opioids in afferent signaling during pathophysiological events is unclear. Thus, the present study tested the hypothesis that peripheral opioid receptors play an important role in modulation of cardiac spinal afferent activity during myocardial ischemia. Nerve activity of single unit cardiac afferents in anesthetized cats was recorded from the left sympathetic chain or rami communicantes (T2 - T5). Thirty-three ischemically sensitive afferents (CV= 0.34-3.90 m/s) with receptive fields in the left ventricle were identified by their responses to five min of regional myocardial ischemia. The responses of these afferents to repeat ischemia or ischemic mediators were further studied in the following protocols. First, epicardial administration of naloxone (80 μ mol), a non-selective opioid receptor antagonist, enhanced the responses of seven cardiac afferents to recurrent myocardial ischemia by 35%, whereas epicardial application of the saline vehicle did not alter responses of six other cardiac afferents to repeat ischemia. Second, epicardial ATP increased activity of five cardiac afferents from 2.0 ± 0.1 to 3.1 ± 0.3 imp/s, and epicardial naloxone (80 μ mol) facilitated the ATP-induced increase in five afferents' activity by 54%. Third, administration of naloxone enhanced the responses of five other ischemically sensitive cardiac afferents to bradykinin by 52%. In contrast, in the absence of naloxone, the cardiac afferents consistently responded to repeated application of ATP (n=5) or bradykinin (n=5). These preliminary data suggest that peripheral opioid peptides modulate cardiac sympathetic afferents responses to myocardial ischemia and ischemic mediators like ATP and bradykinin. (Supported by NIH HL66217)

Keywords: Cardiac sympathetic afferent; opioid receptor; myocardial ischemia; naloxone

Poster #: 87

PARTNERSHIP WITH THE DISCOVERY SCIENCE CENTER: TOWARDS INCREASING DIVERSITY IN HEALTH CARE AND BIOMEDICAL FIELDS

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Data suggests that there is an under-representation of minority youth in healthcare and science fields. The objective of our project was to increase the interest of a diversified population of youth in healthcare and biomedical careers. Through partnership of UC Irvine School of Medicine and the Discovery Science Center in Santa Ana, we established an interactive exhibit for the visitors to learn about the anatomy and functions of the respiratory tract. Using a human simulator model, undergraduate and postgraduate volunteers interested in healthcare careers introduced the young visitors to the anatomy of respiratory system. The visitors had the opportunity to give oxygen using a bag-mask and intubate the simulator. After the hands-on activity, the visitors completed a survey to evaluate the effectiveness of our exhibit. Of 253 respondents, one-third were Hispanic, one-third were Caucasian and the others belonged to other ethnicities. More than 80% of the visitors said that they were more interested in a healthcare career as a result of this exhibit and more than 90% thought this activity should be included in their school's science program. Of 205 comments, 98% were positive. Among these were: 1) "This is the most amazing tabletop demonstration I have ever seen," and 2) "fun learning experience. I can't wait to tell my teacher about it." All of the undergraduate and postgraduate students who served as mentors said that this activity enhanced their leadership skills and their commitment to civic engagement. In summary, our partnership with the Discovery Science Museum has been very effective in promoting the interest of a diverse population of youth towards healthcare fields.

Keywords: under-representation; diversified; minority; youth; ethnicities

Poster #: 88

PERIOPERATIVE EVALUATION OF PSYCHOPHYSIOLOGICAL STRESS RESPONSES IN ADULT SURGICAL PATIENTS

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Perioperative anxiety in adult surgical patients results in the hyper activation of the sympathetic nervous system (SNS) and the hypothalamic pituitary axis (HPA), triggering the release of glucocorticoids thus suppressing the immune system. The objective of this study is to evaluate patients who are thought to have higher risks of developing psychophysiological stress responses, leading to increased surgical risks, increased vulnerability to diseases and increased risks of post surgical complications that will eventually result in greater need for anesthesia and analgesics. A prospective cohort study of adult surgical patients treated at the University of California, Irvine Medical Center (UCIMC) beginning in 2012 was performed to evaluate different factors that have previously been reported to lead to increased perioperative anxiety. Throughout the study, anxiety will be assessed at several time points using physiological measures that incorporate the evaluation of stress hormone levels via salivary samples that specifically tests for salivary alpha-amylase (sAA) as a biomarker for norepinephrine and salivary cortisol. We are evaluating the results of 300 participants who will be providing observational and behavioral data of which 30 participants will be selected for intraoperative salivary evaluation. Within this sample size, certain exclusionary criteria may influence the results of salivary alpha amylase including the use of beta-blockers. While results are pending upon data collection and analysis, we hope to identify patients who are at higher risks of developing perioperative anxiety to direct our resources in the most beneficial direction to improve post-surgical outcomes.

Keywords: None

Poster #: 89

PHYSICAL ACTIVITY, BODY FAT, AND ENDOTHELIAL FUNCTION IN MEXICAN AMERICAN MALE ADOLESCENTS

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This research described the relationships among psychosocial variables, physical activity and physical fitness, and biological measures indicative of cardiovascular health in Mexican American male adolescents using a biobehavioral model. Research aim one described the predictive relationship of psychosocial variables on physical activity and physical fitness. Aim two described the predictive relationship among physical activity and physical fitness on body fat percentages and levels of biological markers indicative of endothelial function in this population. Participants were 28 Mexican American males ages 15-19. Psychosocial variables were assessed using instruments developed for adolescents. Physical activity was measured by a 3-day accelerometer while physical fitness was measured with cycle ergometry with VO₂ max. Biologic measures indicative of cardiovascular health included serum leptin, CRP, adiponectin. Fat mass was assessed using BMI and DEXA scans. Findings demonstrated partial support for the model. Psychosocial variables predictive of physical fitness included perceived benefits of action and interpersonal influences. Perceived benefits of exercise and interpersonal influences significantly predicted physical fitness, the former explained 50% of the variance and the latter predicted 17% of the variance. Physical fitness predicted Leptin levels accounting for 23% of the variance. Physical fitness also predicted 51% of the variance related to the DEXA-derived body fat measurement and 18% of the variance related to BMI. Trends identified included lack of parental support for exercise. Although the study participants reported high acculturated levels, language spoken at home indicated that the family was less acculturated which may have accounted for the lack of parental support. Higher acculturation levels were also significantly associated with increased perceived benefits of action and higher BMI levels. This study suggests that selected psychosocial variables including interpersonal influences should be considered in designing research with Mexican American adolescent males. Additionally objectively obtained measures of physical fitness and activity are in part predictive of measures of endothelial function and body fat.

Keywords: None

Poster #: 90

Post-Keratoplasty Astigmatism Correction with Toric Intraocular Lenses

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Purpose: To evaluate the safety, predictability and efficacy of toric intraocular lens (IOL) placement after cataract surgery to treat high amounts of corneal astigmatism often present after penetrating keratoplasty (PKP). **Methods:** Patients with cataracts in the setting of high corneal astigmatism after penetrating keratoplasty were treated with cataract extraction and toric IOL placement. This was a retrospective study of consecutive eyes at an academic medical center. Outcome measures were uncorrected visual acuity (UDVA), corrected visual acuity (CDVA) and astigmatism (manifest and topographical). **Results:** 20 eyes from 16 patients were studied. Mean patient age was 61.5 years [Stdev 9.3] and mean age of patients PKP at time of cataract surgery and toric IOL placement was 31.3 months [52.2]. Mean UDVA improved from LogMar 0.88 [Stdev 0.49] to 0.22 [0.26], P= 0.0003. Mean spectacle CDVA improved from LogMar 0.32 [0.14] to 0.09 [0.14], P=0.0004. Despite a mean pre-operative topographical astigmatism of 4.9 diopters [2.1], the mean post-operative manifest astigmatism was 1.54 diopters [1.3]. No episode of graft failure or rotational instability of the IOL was noted on post-operative follow up of 14.3 months [13.0]. **Conclusions:** Toric IOLs are a safe, predictable and effective method for reduction of post-keratoplasty corneal astigmatism.

Keywords: Keratoplasty; Astigmatism; Toric; Refractive; Surgery

Poster #: 91

PREDICTING FACTORS THAT INCREASE THE RISK OF HAVING BREAKTHROUGH URINARY TRACT INFECTION IN PEDIATRIC PATIENTS WITH PRIMARY VESICoureTERAL REFLUX

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To establish the factors that will predict the probability for breakthrough urinary tract infection (UTI) in pediatric patients with primary vesicoureteral reflux (VUR). These factors will contribute to the development of a scoring system that will assist providers and parents to decide the correct management strategy on a more individualized basis. The management of pediatric primary VUR has undergone serial changes over the last decade. As this disorder is extremely heterogeneous and high-quality prospective data is limited, the treatment strategies vary among centers. Current treatment options include solely observation, continuous antibiotic prophylaxis, and surgery. Surgical intervention is indicated if a child has a breakthrough urinary tract infection (UTI) while on continuous antibiotic prophylaxis or if renal scars develop. After excluding a secondary cause of VUR, the physician should consider the risk factors affecting the severity of VUR and manage the child accordingly. We retrospectively reviewed the medical records of 151 children diagnosed with primary VUR between June 2008- Dec 2010. Demographical (age at presentation, gender, ethnicity) and clinical factors (VUR grade, laterality, presence of renal scars, time of initial presentation, number of UTIs, and presence of any bladder or bowel dysfunction) were collected retrospectively. It was found that females with high grade VUR (IV-V) are more at risk for breakthrough UTI (p-value < 0.001). High grade VUR diagnosed by UTI showed a trend toward a significant factor. Other variables such as laterality, age indication of diagnosis had no significant values that would predict the chance of breakthrough UTI. With the information obtained, it is still premature to create a scoring system; however, it is known that some demographic and clinical variables contribute to increase the risk for breakthrough UTI.

Keywords: Vesicoureteral Reflux (VUR); Breakthrough Urinary Tract Infection; Voiding Cystourethrogram (VCUG)

Poster #: 92

PRELIMINARY FINDINGS OF OUTCOMES FROM THE UC IRVINE CHILD DEVELOPMENT SCHOOL

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Multi-modal treatments for children with neurodevelopmental disorders may include classroom intervention, social skills training, group cognitive-behavioral therapy, and parent training. The objective of this study was to conduct a preliminary examination of the effectiveness of a family-based intervention that includes all of the aforementioned components delivered in a school setting to children with neurodevelopmental disorders and their parents on three outcomes: (1) child disruptive behaviors, (2) parental stressors associated with child disruptive behaviors, and (3) overall parenting stress. Participants in the study were students in a unique year-round school-based intervention program specifically designed to provide an environment in which children with neurodevelopmental disorders (e.g., autism spectrum disorder, attention deficit/hyperactivity disorder). Children were between the ages of 5 and 11 years (Mage = 7 years). School-based intervention for these children consisted of daily group cognitive-behavioral social skills training, in-class behavior support, and structured clinical case management and behavioral progress monitoring. Additionally, parents of participants attended weekly group-based cognitive-behavioral intervention aimed at supporting generalization of children's therapeutic gains. Child disruptive behaviors were assessed using the SNAP-IV (Swanson et al., 2001), which is a parent questionnaire about child symptoms of inattention, hyperactivity and impulsivity, and opposition and defiance. The occurrence and severity of stress related to children's disruptive behaviors were measured using the Disruptive Behavior Stress Inventory (Johnson & Reader, 2001) parent questionnaire. Overall parenting stress was assessed using the Parenting Stress Index-Short Form (Abidin, 1995) parent questionnaire. All parent questionnaires were completed at two time points: (1) at intake or upon enrollment and (2) approximately 12 months (9-15 mont

Keywords: ADHD; Autism; School-based Mental Health; Social Skills; Parent Stress

Poster #: 93

PREVALENCE AND CLINICAL IMPORT OF THORACIC INJURY IDENTIFIED BY CHEST CT BUT NOT CHEST RADIOGRAPH IN BLUNT TRAUMA PATIENTS

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Objectives: With enhanced sensitivity of chest computed tomography (CCT), injury is found more often than with chest xray (CXR) alone (occult injury (OI)). We describe the prevalence and clinical outcome of OI. Primary outcome was OI with intervention, mechanical ventilation, repeat clinical or radiographic evaluation, or surgery. Secondary outcome was admission rate and observation hours due to OI. We hypothesized infrequent clinical consequences of OI may obviate need for further evaluation. **Methods:** We prospectively collected data on 486 blunt chest trauma patients (pt) at UCI ED (2011-12) with both CXR and CCT. OIs were: pneumothorax (PTX), hemothorax (HTX), sternal or > 2 rib fractures (fx), pulmonary contusion, spine or great vessel injury, found by radiology on CCT but not on preceding CXR. **Results:** 148 (30%) pt had injury by either study and 106 (72%) of these had 1 to 4 OI; 74 (50%) had no injuries on CXR. These OIs were 29 pulmonary contusions, 21 PTX, 19 HTX, pt with > 2 rib (n=50) or sternal (n=32) fx, 2 injuries to great vessels, 9 thoracic spine fx, and 40 patients with multiple OI. These interventions were ascribed to the OI: 107 repeat imaging on 70 patients (105 CXRs on 70 pt; 2 of these who also had a repeat CT), 86 admissions, 8 pt mechanically ventilated and 9 thoracostomies. For OIs, 1/29 (3%) pt with pulmonary contusion were ventilated (3 also with PTX), while 6/19 (32%) HTX and 3/21 (14%) PTX had thoracostomy. 13/17 (76%) sternal fx and 8/25 (32%) with > 2 rib fx as isolated OI had pain management/ observation > 24 hours. 1/2 pt with OI of aortic/great vessel injury had surgery. 1/9 (11%) OI of spinal fx had surgery. 11 OI pt (10%) were observed in the ED (med 6 hrs, IQR 6-9 hrs), and 86 (81%) were admitted (med 3 d, IQR 1-8 d). 51 (48%) had ISS > 15 and 4 died (2 of brain trauma). **Conclusion:** OI pt had a high incidence of complications requiring medical intervention. CCT is a useful modality to evaluate blunt chest trauma.

Keywords: Trauma; Imaging; Cost Effectiveness

Poster #: 94

PRIMARY ULTRASOUND ASSESSMENT

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OBJECTIVE : While various uses of bedside ultrasound in emergency medicine, obstetrics and gynecology, trauma, and other specialties have been rigorously studied in clinical settings, little has been reported on its role in primary care family medicine, especially when performed by medical students. The purpose of this was to study the feasibility of a medical student performed Primary Ultrasound Assessment (PUA). **METHODS:** MS1-MS4 with ranging levels of ultrasound training (one introductory ultrasound session to 15 months of integrated ultrasound curriculum training) received a 25 minute presentation on the PUA and a 30 minute hands-on session. The PUA included visualization of the thyroid, heart, liver, gallbladder, abdominal aorta, kidneys, bladder, and prostate/uterus transabdominally. Intimal Medial Thickness was the only measurement taken. When comfortable, students were asked to perform a timed PUA on 2-3 people that the student had not scanned before. All images were documented as normal or abnormal for significant abnormalities and basic physiology. All images were over-read and deemed adequate by Emergency Medicine Ultrasound Fellows. **RESULTS:** 9 students agreed to be timed. The PUA was performed 26 different times. The average time spent was 11 minutes 19 seconds. Average Time spent by MS4s, MS3's, MS2s, MS1s was 13:36, 9:04, 11:48, and 14:42 minutes respectively. The times ranged from 6:32 to 17 minutes. Students improved their time by 1-5 minutes with each person they scanned. **CONCLUSIONS:** The data shows us that the time spent performing a PUA is inversely proportional to the amount of ultrasound training of the students. MS2s and MS3s who have been part of the integrated Ultrasound in Medicine Curriculum spent the least amount of time on the PUA. It was also observed that the two time consuming factors of the PUA were gall bladder and intimal medial thickness assessments. The next step is to assess the feasibility and outcomes in clinical practice.

Keywords: Ultrasound; Medical Student; primary care

Poster #: 95

Repetitive Electroacupuncture Attenuates Cold-Induced Hypertension and Simultaneously Enhances rVLM Preproenkephalin mRNA Expression

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Acupuncture lowers elevated blood pressure in clinical and experimental hypertension, likely through an opioid mechanism. To mimic human studies, we performed repeated electroacupuncture (EA) on unanesthetized male SD rats (150g) exposed to cold (5°C) for 11 weeks. Systolic tail cuff blood pressures (SBP) were measured weekly. Rats were randomly divided into EA-hypertension (n=9), sham (n=6) and untreated hypertension groups (n=6) after 6 weeks of cold exposure. Blood pressures measured outside the cold room (25°C) stabilized at an elevated level in the three groups. EA and sham groups received either repetitive EA (1-4 mA, 2 Hz, 0.5 ms) at ST36-37 acupoints (overlying deep peroneal nerve) or sham (needle placement without electrical stimulation) for 30 min twice weekly for 5 weeks. The elevated SBP in the EA group was reduced after 5 sessions and remained low throughout EA treatment (155 ± 4 vs. 187 ± 3 mmHg EA vs. sham). The relative ratio of preproenkephalin mRNA (normalized to 18s) in rVLM 72 hr after the terminal EA treatment was increased in the EA (14.3 ± 1) compared to the sham group (4.3 ± 0.5), which was similar to values in the untreated hypertensive rats (4.3 ± 0.6). These data suggest that the prolonged inhibitory effect of EA is related to prolonged increases of opioid mRNA expression in the rVLM (Supported by AHA postdoctoral fellowship 10POST4190125, NIH HL-63313 and HL-072125).

Keywords: acupuncture; hypertension; opioid

Poster #: 96

Robotic Assisted Radical Prostatectomy (RARP) and Localized Hypothermia's Impact on Continence and Inflammatory Response

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INTRODUCTION-The hypothesized mechanism for improved continence from regional hypothermia during RARP is reduction of trauma-induced inflammation. Neutrophils (PMNs) are the first cells to migrate to the site of tissue injury, and thus, PMN counts are a reliable measure of the inflammatory response to surgical trauma. **METHODS-**PMNs were counted in men undergoing RARP without hypothermia (n=58) and RARP with hypothermia (hRARP, n=52). An endorectal cooling balloon was used for hRARP to attain localized pelvic cooling with ~4°C saline. An experienced pathologist selected sites from peri-prostatic posterolateral tissues with the greatest population of PMNs from de-identified pathology slides. Mean PMN counts from 5 high-powered fields were utilized for statistical analysis. **RESULTS-**The Control and hRARP groups had comparable demographic factors (p value 0.08-0.99): age (61.1 v. 60.5), pre-op PSA (5.8 v. 5.0), AUA (8.1 v. 8.0), Bother (1.4 v. 1.5), IIEF-5 (19.9 v. 20.2), BMI (26.0 v. 26.5), pre-Hgb (15.2 v. 15.0), prostate wt (52.4 v. 52.3), and Gleason Score (6.7 v. 6.7). With advancing age, mean PMN counts increased for controls, but the hRARP group had diminishing infiltration of PMNs. Overall, the mean and median number of PMNs was reduced ~50% (61 vs. 24) for hRARP versus controls (p= 0.002). A Kaplan-Meier of time to reach 0-pad continence between groups, demonstrated a significantly shorter recovery (median of 22 vs. 64 days) for hRARP as compared to controls (p<0.001). **CONCLUSION-**This blinded pathological study demonstrated a 50% reduction in PMNs supporting an anti-inflammatory mechanism for the beneficial effects of hypothermia on urinary outcomes following RARP. Among controls, localized inflammation increased with advancing age given the same amount of trauma. Our data supports that as men age the increased risk of incontinence is inflammation related and hence the impact of hypothermia is markedly improved.

Keywords: continence; robotic prostatectomy; inflammation; neutrophil; hypothermia

Poster #: 97

SIGNALING PROFILE OF THERMAL TRAUMA (SPoTT) – EXUDATE ANALYSIS IN ACUTE BURN PATIENTS

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• OBJECTIVES/SPECIFIC AIMS Aim 1: Compare a range of signaling mediators elaborated in the exudate of acute burn wounds in the first 48 hrs in superficial versus deep burns in the same patient. Aim 2: Compare blood levels of these mediators with the levels in the burn exudate to establish a correlation or lack there-of. Aim 3: Establish a diagnostic test based on these results that would enable objective measurement of efficacy of certain anti-inflammatory dressings and possible therapeutic interventions • METHODS/STUDY POPULATION Burn Center UCI; Patients sustained burn wounds >20% body surface area over 18 yrs old. Two small exudate collection devices will be placed on burn wound, one in area of superficial wound, the other on deeper burn wound area. At 4-6hrly intervals exudate and blood samples will be collected and analyzed (IL-1 β ;6,8; IL-4;10;2:TNFa: IFN γ ; MMP 2;9: TIMP1,2; MCP-1; G-CSF; MIP-1) Comparisons will be made between levels of burn injury, exudate and blood levels and assessment of healing outcomes • RESULTS/ANTICIPATED RESULTS We expect to show little correlation between blood and exudate levels indicating the importance of measurement at the wound interface. Additionally we expect the depth and intensity of the burn to correlate with the levels of signaling mediators. • DISCUSSION/SIGNIFICANCE OF IMPACT Cytokines have been shown to be involved in major systemic events in burn injuries involving the heart, intestines, blood vessels and local tissue damage. Blockage of this cytokine outpouring has prevented many of these systemic consequences in experimental animal models. Most analyses of cytokines, proteases and other signaling molecules have been focused on blood and serum rather than the wound interface although there is evidence that the blood levels do not correlate well with local tissue levels. Additionally no standardized burn interface diagnostic exists that measures the acute signaling profile in the first 48 hours of the thermal injury in the burn wound exudate. This study involves collaborative efforts between UCI departments of Plastic Surgery, General Surgery, Biomedical Engineering and Biochemistry. This SPoTT test would have significant impact on interactive wound dressing design and ultimate management of the patient in this critical early period of significant thermal trauma.

Keywords: burn exudate; signaling mediators; cytokines; SIRS

Poster #: 98

SIGNIFICANT IMPROVEMENTS IN ADOLESCENT POMPE DISEASE WITH ERT, NUTRITION AND EXERCISE.

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UC Irvine has been established as a treatment center for Pompe disease, a lysosomal storage disorder caused by the deficiency of enzyme acid alpha-glucosidase (GAA) which results in accumulation of glycogen particularly in the skeletal, cardiac, and smooth muscles. The adolescent and late-onset forms with symptoms presenting in childhood and adulthood respectively is characterized by proximal muscle weakness and respiratory insufficiency. We report a 17-year-old male diagnosed with Pompe disease at 11 years of age by muscle biopsy for fatigue, difficulty breathing, scoliosis, and progressive muscle disease of two years duration. Genetic sequencing revealed a c.1655T>C in exon 12 and a c.2238G>C, (PRP 746 CYS) in exon 16. Enzyme replacement therapy (ERT) with alglucosidase alfa paired with a cardio-intensive exercise regime and increase in protein intake have demonstrated an increase in pulmonary function (FVC measured pre-ERT 0.72 L to 1.48 L), an increase in distance covered in the 6-minute walk test (pre-ERT 1414 ft/ 6 min to 1815 ft/6 min), decrease in his BiPAP IPAP and EPAP settings from 28 to 16 cm H₂O and 18 to 6 cm H₂O, and increase in grip strength from 28lbs pre-ERT to 80lbs. Improvements in our patient's overall health and well-being have been described since he began the exercise and diet program in addition to ERT.

Keywords: Lysosomal Storage Disease; Pompe; Enzyme Replacement Therapy; Exercise; Nutrition

Poster #: 99

SIMULATION-BASED STRUCTURED INTERVIEWS STRATIFY RESIDENCY CANDIDATES IN PHASE ONE

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Objectives: The objective of anesthesiology resident selection is to identify candidates who will maximize educational resources and deliver superior patient care while minimizing disruptions for the residency program. Selection is based on cognitive (exam scores, grades) and non-cognitive (interviews, statements, references) domains. Unfortunately, interviews for residency show poor predictive validity. We hypothesize that a simulation-based structured interview will predict overall residency performance better than the traditional residency interview. **Methods:** In the control arm candidates participated in two 15-minute faculty interviews. In the experimental arm candidates received individual teaching on simulations by faculty in 3 12-minute sessions. Candidates were evaluated using the 6 ACGME core competencies on a Likert scale of 1-7 and given an overall rating. Performance during the simulation interview and residency will be examined and compared after a two year follow up. **Results:** Of 49 points, the average score was 32 for ultrasound, 34 for TEE, and 31 for fiberoptic. Average overall score was 32 (SD 5.41) for simulation and 40 (SD 3.35) for standard interview. There was limited correlation in overall score between interview styles ($R^2 = 0.0732$). Ranks (low, neutral, high) were 20 (6%), 197 (63%) and 98 (31%) for simulation and 9 (4%), 28 (14%) and 168 (82%) for standard interview respectively. **Discussion:** The simulation-based interview stratified candidates to a greater degree than the standard interview (SD 5.41 vs. SD 3.35) facilitating identification of outlier candidates. This occurred even though raters from each arm completed identical rating instruction. This suggests that the simulation interview framework provides more opportunity to independently evaluate non-cognitive attributes and provided a fundamentally different impression of subjects' non-cognitive attributes. Final comparisons will be made after the phase 2 follow-up.

Keywords: Anesthesiology Residency; Selection; Interview; Simulation; Non-cognitive

Poster #: 100

Sleep Quality Impacts Outcome of Prolonged Exposure Therapy for PTSD

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Background: Veterans with obstructive sleep apnea (OSA) have a high rate of PTSD (odds ratio of 2.9; Sharafkhaneh, 2005). In our own examination of a large civilian database (2002 National Inpatient Sample, ~6 million inpatient stays sampled to approximate a 20% sample of community hospitals) we similarly found an odds ratio of 1.9 for the diagnosis of PTSD in patients with OSA. One mechanism underlying this relationship is that impaired sleep disrupts fear extinction. For example a study by Pace-Schott (2009) found in a human trial lack of sleep hindered the generalization of extinction. Krakow (2002) found that PTSD symptoms in fire disaster evacuees significantly improved after chronic sleep symptoms were corrected. This presentation explores the hypothesis that sleep quality is an important factor in effectiveness of prolonged exposure (PE) **Methods:** We examined data from a group of 29 civilian PTSD subjects treated with 10 sessions prolonged exposure. Item 13 from the CAPS was used to determine the presence/severity of sleep disturbance. Final total CAPS score after PE therapy was the dependent variable. **Results:** An extreme phenotype approach was taken identifying those subjects scoring in the highest and lowest quartile of sleep disturbance. A baseline sleep disturbance was associated with a poorer improvement after treatment (final CAPS score 18.4 v 52.6, $p = 0.026$). In terms of treatment response (CAPS < 20) only 14% of subjects with sleep disturbance showed a response vs 57% of without sleep problems. **Conclusions:** This data suggests that sleep quality impacts efficacy of PE therapy. Sleep disturbance, including OSA, may also be a risk factor for PTSD and may warrant correction prior to PE treatment.

Keywords: PTSD; sleep apnea; prolonged exposure therapy

Poster #: 101

Small Cell Lung Cancer cells express a late stage tumor antigen, gBK; its implications for preventing the terminal disease.

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Abstract Immunotherapy of malignant tumors is making progress towards improving patient survival with some cancers. The Herceptin antibody which targets a critical growth factor receptor on breast cancers has significantly improved survival in those women whose tumors over-express that receptor. Not only does Herceptin receptor blockade interfere with a key growth factor signaling pathway on the tumor cells, but it permits antibody-dependent cell-mediated cytotoxicity. This represents a dual-purpose anti-tumor effect. Purpose: We found that glioma BK (gBK) mRNA and protein were highly expressed in human small cell lung cancers (SCLC) patients at their time of death, while little expression of gBK was present in the initial SCLC. This empirical finding suggests that gBK expression is a sign of progression towards the terminal SCLC stages. Experimental Design: Human surgical and autopsy samples of SCLC were studied along with SCLC cell lines using real time PCR, antibody staining and functional assays. Human cytolytic T lymphocytes (CTL) showed the translation potential of this molecule. Results: SCLC cell lines responded to specific BK channel activators by swelling. This response was specifically inhibited by using Iberotoxin, indicating that functional BK channels were present. Five-hour exposure to BK channel activators induced cell death within SCLC cell lines. Human CTL generated against two epitopes found within the gBK region killed HLA-A2+ SCLC cells, while HLA-A2+ human embryonic kidney cells that are gBK-negative were not killed. The exposure of SCLC to interferon- γ (IFN- γ) increased the expression of HLA-A2 on SCLC; these treated cells were killed better than those cells not treated with IFN- γ . IFN- γ treated SCLC cells diminished gBK protein expression. Prolonged incubation with IFN- γ slowed the in vitro growth of the SCLC cells, suggesting a novel method of inhibiting tumor growth. Conclusions: Immunotherapy of SCLC using gBK could be designed around the idea of “immuno-preventing” the terminal phases of this cancer. The lymphocyte mediated effector function may even be mediated through a novel non-cytolytic dependent process.

Keywords: gBK; Small Cell Lung Cancer; tumor antigen

Poster #: 102

ST. JUDE NEIGHBORHOOD CENTER HEALTHY LIFESTYLES PROGRAM

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Since the 1970s, the prevalence of obesity has doubled in the United States¹ and tripled in developed countries.² Similarly, rates of childhood obesity more than doubled in the last three decades in the United States.³ In addition, ethnic minorities tend to have particularly high rates of overweight and obese children, compared to non-Hispanic Whites.⁴ Studies measuring statewide economic impact of health suggest that Orange County is second only to Los Angeles County in the economic costs of children and adults who are overweight or obese; costing an estimated \$3.3 billion per year in health expenditures.⁵ St. Jude Children's Research Hospital aims to prevent chronic childhood illnesses and is currently implementing various community based programs in order to decrease rates of childhood obesity. This study evaluates the effectiveness of the Healthy Lifestyles Program implemented by St. Jude to help children either maintain or reduce their weight and BMI at baseline. Eligible patients were referred to the health center by a pediatrician and needed both initial (at time of referral) and follow up anthropometric data. Participants consisted of 200 overweight and obese children ages 3-18 years (M = 10.6, SD = 3.7) at the time of referral to St. Jude Neighborhood Health Center in Fullerton, CA. Anthropometric data was collected at the time of referral to the Neighborhood Health Center, which was used as baseline data (time 1). Similarly, data was also abstracted for every time period that the child was seen at the health center following the referral. Approximately half the sample was male (50.6%) and resided in Fullerton, CA (58.4%). One-way analysis of variance (ANOVA) indicated that the more sessions attended, the lower the BMI & BMI percentiles of the patients overtime (F(1,152)=236.39, p<.01). Similarly, a regression analysis suggested that the total number of sessions significantly predicted weight loss (b = 5.40, t(154) = 15.38, p < .001) and change in BMI (b = .44, t(154) = 6.56, p < .001), when controlling for the change in height and weight. The Healthy Lifestyles program successfully decreases the rates of pediatric obesity, if the patients attend the required number of sessions of the program. If implemented nationwide, this program has the potential to decrease childhood obesity rates significantly.

Keywords: Obesity; Health Promotion; Health Education; Community-based Interventions; Childhood Obesity

Poster #: 103

SUCCESS OF LUMBAR PUNCTURE AFTER USING ULTRASOUND TO IDENTIFY LANDMARKS

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Objectives: Lumbar puncture (LP) is commonly performed in the emergency department to assess for a variety of diagnoses. Often, LPs are time consuming or require multiple attempts that causes patient discomfort and results in a traumatic tap, limiting diagnostic utility. In prior studies, ultrasound (US) has been shown to increase success of LP. We hypothesized that the use of US to identify landmarks for LP would decrease procedure time and the number of traumatic taps, as compared to palpation. **Methods:** This was a prospective randomized study of adult ED patients who required an LP as a standard of care. Each LP was randomized to identification of LP landmarks by US or by palpation and performed by residents or faculty, trained in US guided LP. The following was recorded: time from needle insertion to CSF return, the number of needle redirections/reinsertions, and the number of RBCs in the last tube of CSF collected. The results were analyzed by comparing the medians via the Kruskal-Wallis rank test. **Results:** Seventy-eight LPs (78 patients; 33US, 45 Palp) were enrolled. There was no difference in time from needle insertion to CSF return (US median: 195sec (IQR 101-590), Palpation median: 154sec (IQR 68-269); yielding $P=0.15$). There was no difference in needle redirections (US median: 3 (IQR 1-6), Palpation median: 2 (IQR 0-5); yielding $P=0.52$) or needle reinsertions (US median: 1 (IQR 0-2), Palpation median: 0 (IQR 0-2); yielding $P=0.57$). There were significantly less traumatic taps (RBCs in tube 4) in the US group (US median: 0 (IQR 0-2), Palpation median: 3.5 (IQR 0-11); yielding $P=0.04$). **Conclusion:** In a sample of adult ED patients, identification of LP landmarks by US yielded significantly less traumatic taps. There was no significant difference between using US to identify LP landmarks versus using traditional palpation with respect to time to CSF return and the number of needle redirections or reinsertions.

Keywords: Ultrasound; lumbar puncture; emergency department; critical care

Poster #: 104

TELOMERE LENGTH AND IRON OVERLOAD: THE INFLUENCE OF PHENOTYPE AND GENOTYPE

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HFE-related hereditary hemochromatosis (HH) occurs most often in individuals who are homozygous for the C282Y polymorphism of the HFE gene. The excess iron deposition in HH is associated with biomolecular oxidative damage and may lead to age-related conditions. Shortened telomere length has been associated with shorter life span. We examined the relationship between HFE gene mutations, elevated iron levels and telomere length. The Hemochromatosis and Iron Overload Screening (HEIRS) Study evaluated a multicenter, multiethnic sample of 100,000 primary care adults 25 years of age or older. Those with elevated values of transferrin saturation (TfS) and serum ferritin (SF) and/or homozygosity for HFE C282Y were invited to undergo a clinical examination, as were frequency-matched control subjects. We classified the participants by genotype and phenotype as G+ (HFE C282Y homozygotes, H63D homozygotes, or compound heterozygotes), G- (homozygous wild type for HFE C282Y and H63D), P+ (TfS > 45% and SF > 300 ng/mL in men or SF > 200 ng/mL in women) and P- (TfS < 45% and SF < 300 ng/mL in men or SF < 200 ng/mL in women). Genotype-phenotype groups were G+P+, G-P+, G+P-, G-P-. Specimens and clinical data were collected from randomly selected members of the G+P+, G-P+, G-P- groups and from all participants in the G+P- group. The final sample consisted of 1,009 subjects; 257 had short telomeres, and 248 had long telomeres. Groups differed significantly by gender, race/ethnicity, and health insurance ($p<0.001$ for all). Short telomeres were associated with elevated iron phenotype ($p<0.001$) but not HH genotype ($p=0.67$). Compared to the G-P- group, the adjusted odds of a shortened telomere length in the G+P+ and G-P+ groups was 2.18 (95% CI, 1.22-3.91) and 2.21 (1.49-3.27) times that of the longer telomere group, respectively. Elevated iron levels were associated with shorter telomere length in this population, independent of HFE gene mutations, age, gender, and race-ethnicity.

Keywords: Iron; Oxidative stress; Hemochromatosis; telomere length

Poster #: 105

THE AUTISM IN PRESCHOOLERS STUDY (T.A.P.S.)

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The main objectives of TAPS are: 1) to study the health and wellness of three-year-old children with ASD, and 2) to examine the criterion validity of three autism spectrum disorder (ASD) case-confirmation instruments that could potentially be incorporated into the final National Children's Study (NCS) protocol. The sample for TAPS will include 100 three-year olds: 60 with Autism and 40 with other neurodevelopmental disorders. We will study specific domains of health and wellness, including physical activity, cognitive functioning, sleep quality, and family relationships. In collaboration with the Pediatric Exercise Research Center, we will sample children's activity levels using accelerometers and will ask parents to report on participation in sports and other recreational activities. We will observe parents and children interacting in the Strange Situation and will code their co-regulation using a structured parent-child interaction rating system. We will also gather data on sleep patterns and habits. To evaluate case-confirmation instruments, we will participate as one of ten sites involved in an NIH-funded NCS formative research collaborative. The overarching goal of the NCS (parent project) will be to examine the effects of the environment and genetics on child development. Participants will be 100,000 children enrolled before birth and followed until age 21 years. As the recent prevalence estimate of ASD has increased to 2% (Centers for Disease Control and Prevention, 2013), an estimated 2,000 participants in the NCS project will have ASD. A clinical evaluation for ASD involves a comprehensive developmental history and behavioral observation. The administration time for current measures considered to be the gold standard for ASD confirmation can exceed three hours. Furthermore, assessors for these measures receive extensive instrument-specific training. These measures would not be feasible for use in the NCS due to participant burden and personnel demand.

Keywords: Autism; Physical Activity; Cognitive Functioning; Sleep; Parent-Child Interactions

Poster #: 106

The Biomechanical Effects of the Remplissage Technique for Engaging Hill-Sachs Lesions

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Objectives: Individuals with large Hill-Sachs lesions may be prone to failure and reoccurrence following standard arthroscopic Bankart repair. The remplissage procedure may promote shoulder stability through infraspinatus capsulo-tenodesis directly into the lesion. However, little biomechanical data about the remplissage procedure on glenohumeral kinematics, stability, and range of motion (ROM) currently exists. **Methods:** Six cadaveric shoulders were tested using a custom shoulder testing system. ROM and glenohumeral translation with applied loads in anterior-posterior (AP) and superior-inferior (SI) directions were quantified at 0° and 60° gleno-humeral abduction. Six conditions were tested: intact, Bankart lesion, Bankart with 40% Hill-Sachs lesion, Bankart repair, Bankart repair with Remplissage, and Remplissage repair alone. **Results:** Humeral external rotation (ER) and total range of motion (TR) increased significantly from intact after the creation of the Bankart lesion at both 0° abduction (ER +27.0°, TR +35.8°, p<0.05) and 60° abduction (ER +9.5°, TR +30.7°, p<0.05), but did not increase further with the addition of the Hill-Sachs lesion. The Bankart repair restored range of motion to intact values 0° abduction at addition of the Remplissage repair did not significantly alter range of motion from the Bankart repair alone. There were no significant changes in AP or SI translation between Bankart repair with and without Remplissage compared to the intact specimen. **Discussion:** The addition of the Remplissage procedure for treatment of large Hill-Sachs lesions had no statistically significant effect on ROM or translation for treatment for large Hill-Sachs lesions. The Remplissage technique may be a suitable option for engaging Hill-Sachs lesions. Further clinical studies are warranted.

Keywords: Orthopaedic Surgery; Biomechanics; Shoulder

Poster #: 107

The cardiovascular phenotype of human MPS I is recapitulated in the canine and murine MPS I model systems

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Objectives: Prior to the development of hematopoietic stem cell transplantation (HSCT) and intravenous enzyme replacement therapy (ERT) as treatments for mucopolysaccharidosis type I (MPS I), one of the leading causes of death was myocardial infarction caused by obliteration of the coronary artery lumen by storage material. While HSCT and ERT have dramatically altered the natural history of MPS I, enabling patients to survive past childhood, complications related to coronary artery stenosis are being recognized as fatal manifestations even of treated MPS I. Very few studies have focused upon elucidating the MPS I cardiovascular phenotype, its underlying mechanisms, and reasons for its treatment resistance. Specific aim 1: To determine if carotid intima-media thickness (cIMT) is increased in human MPS I patients in vivo and correlates with increased arterial stiffness. Coronary intimal proliferation may be a pan-arterial phenomenon that is measurable in living patients in the form of increased cIMT, which results in reduced arterial compliance Specific aim 2: To characterize alterations in arterial gene and protein expression caused by MPS I disease in the canine MPS I model system. Similar arterial plaques are seen in MPS I canine aortas. Perturbations in gene expression will identify pro-inflammatory, pro-atherosclerotic expression profiles Specific aim 3: To determine if the murine MPS I model system recapitulates the cardiovascular phenotype and gene expression profiles. The C57BL6 MPS I mouse model will also demonstrate arterial intima-medial plaques, elastin fibril degradation, and an expression profile similar to that seen in the MPS I canine model **Methods:** 1) Carotid intima media thickness (cIMT) was measured twice over a two-year span via ultrasonography. From the second imaging study, metrics of carotid elasticity were calculated. 2) Gene expression in ascending and descending aortas taken from four 1.5 year-old MPS I dogs who did not receive systemic ERT was compared with expression from three normal, age-matched dogs. Only genes that showed more than 5-fold over- or under-expression in both aortic segments were selected for further analysis 3) Certain genes with relevance to arterial disease were selected for Western blotting and aortic in-situ immunohistochemistry to confirm overexpression of the protein product 4) Aortas from 6 - 9 month old MPS I mice fed with standard chow were sectioned, fixed, and stained for lipid, elastin, collagen, markers of atherosclerosis, and murine homologs of the canine proteins assessed in 3) **Results:** 1) cIMT was significantly elevated in all MPS patients studied compared to matched controls 2) cIMT correlated with reduced aortic elasticity and increased wall stiffness in MPS I, II, and VI patients

Keywords: mucopolysaccharidosis; vascular; outcome; translational; biomarker

Poster #: 108

The Effect of Extracellular Matrix Proteins from Lung on the Migration of Breast Cancer Cells

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OBJECTIVES: Little is known about the mechanism of breast carcinoma metastasis to lung. The purpose of this study was to determine if extracellular matrix components from the pulmonary microenvironment had the potential to encourage metastasis by inducing motility in breast carcinoma cells. **METHODS AND RESULTS:** Products of conditioned media of pulmonary epithelial cell co-cultures induced dose-dependent motility in breast carcinoma cells. The deposited material was analyzed by mass spectrometry, revealing extracellular matrix proteins, including thrombospondin 1 (TSP), tenascin C, transforming growth factor-beta-induced protein ig-h3 (beta ig-h3), and the alpha3 and beta3 chains of laminin 332 (LN332). Motility assays revealed that LN332 induced greater motility at all concentrations tested. Since pulmonary cells grown on membranes at a liquid air interface more closely resemble the structure of lung tissue in vivo, cells grown in this manner were tested for their ability to produce LN332 and induce motility. Membranes with cells on the surface exposed to air were fixed in formalin, paraffin embedded and sectioned for hematoxylin and eosin staining and immunohistochemistry. Immunohistochemistry revealed that the cells produced LN332, which was both cytoplasmic and in a layer on the membrane surface beneath the cells. Lung cells growing at the liquid air interface were removed from the membrane, and MCF-7 cells were added to the same membrane from which lung cells had been removed, or to membranes which had been incubated with pulmonary cell growth media but no lung cells. Whereas MCF-7 cells placed on membranes without prior lung cells grew in tight clusters, MCF-7 cells added to membranes on which lung cells had been removed showed scattering and pseudopodia formation. This response was blocked by antibodies to alpha3 and beta1 integrins, which are receptors of LN332. Finally, western blots of human lung tissue revealed the presence of LN332. These experiments t

Keywords: Metastasis; Lung; Breast Carcinoma; Extracellular Matrix; Laminin332;

Poster #: 109

The effects of incorporating service-learning into a health mentorship program

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Diversity in healthcare is becoming more and more important. Therefore effective mentorship programs that promote the interest of underrepresented minority (URM) in healthcare are needed. In this study, we evaluate the effect of providing undergraduate course credit to mentors on the drop-out rate of the mentor/mentee pair from a mentorship program. In 2009, we implemented a program where undergraduate students were matched with URM high school students through an application process and provided one-on-one mentorship throughout the academic year. In addition to providing guidance and counseling for college entrance, the mentor guided the mentee towards the completion of a project related to a health challenge in their underserved community. Both mentors and mentees stated their interests and their future goals on the applications. The one to one match was made mainly based on shared interests and goals. Between 2009 and 2012, we matched a total of 63 mentors and mentees. There were 12, 23, and 28 matches made in 2009-2010 and 2011 respectively. Course credit was offered during 2011-12 academic year only. Of 12 pairs whose mentors took credit for this activity, all mentees stayed in the program until the end of the academic year. While of 51 pairs whose mentors did not get credit for the activity, only 26 (51%) completed the program ($p < 0.05$). Our data suggests that giving course credit for outreach mentorship programs increases retention rates. Further studies are needed to study other variables that may affect retention rates in health-related mentorship programs.

Keywords: Community Health; Diversity; Service Learning; Mentoring; Intervention

Poster #: 110

The Pharmacological Evaluation of a Rodent Model of Low Back Pain Due to Degenerative Disc Disease - the Beta-Catenin Mouse Model

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Anesthesiology & Perioperative Care

A major cause of low back pain can be attributed to degenerative disk disease (DDD). β -catenin Conditional Activation (cAct) mice overexpressing the protein β -catenin in chondrocyte cells show accelerated development of DDD (chondrocyte formation, loss of endplate chondrocytes and cartilage area, disc space narrowing, and new woven bone). To investigate if DDD leads to the development of behavioral hypersensitivity states, β -catenin conditional activation (cAct) mice were generated from cross-breeding of Col2a1-CreERT2 transgenic mice with β -catenin^{flx}(Ex3/fx(Ex3)) mice in which exon 3 of the β -catenin gene is floxed by Cre-recombinase. Injection of tamoxifen (TM) in adult mice (3 months of age) leads to exon 3 deletion and over-expression of β -catenin protein. TM administration to adult β -catenin cAct and control mice led to development of hindpaw behavioral hypersensitivity to non-painful mechanical stimulation (allodynia) and thermal stimuli (hyperalgesia) that correlates with the level of β -catenin overexpression. Next, we challenged the model with 3 different types of pharmacological agents that have been clinically evaluated in LBP to determine the pathways involved in the pain states, and the suitability of this model as a translational model to humans with LBP. β -catenin cAct mice with pain states and age-, sex-matched wild type littermates were treated dose-dependently with morphine, gabapentin, and ketolorac followed by assessment of behavioral sensitivity to stimuli to define the pain-mediating pathways. The data shows that all these agents are effective in reversing behavioral hypersensitivity to mechanical stimuli. The data shows that all these agents are effective in reversing behavioral hypersensitivity to mechanical stimuli. Understanding the possible mechanism of dysfunction of the sensory fibers in an adult DDD model will allow us to develop modality-specific therapeutics for the treatment of hypersensitivities related to DDD.

Keywords: Degenerative Disc Disease; Pain Models; Neuropathic Pain

Poster #: 111

THE ROLE OF THE WNT/BETA-CATENIN SIGNALING PATHWAY AT THE MOTOR ENDPLATE FOLLOWING TRAUMATIC NERVE INJURY

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Hypothesis: We recently showed that preservation of the motor endplate after traumatic nerve injury improves functional recovery after surgical repair. Developmentally the Wnt signaling proteins, particularly the canonical Wnt/beta-catenin pathway, plays an important role in maintenance of motor endplates. These studies have shown that the NMJ is affected by multiple factors including agrin, MuSK, and Wnt pathways. In particular, Wnt3a has been shown to inhibit agrin-induced AChR clustering by suppressing rapsyn expression via beta-catenin-dependent but TCF/LEF independent signaling. Therefore, we explored the role of Wnt/beta-catenin after traumatic nerve injury. **Methods:** Gastrocnemius, soleus and plantaris muscles were harvested at 1-month and 2-months after nerve injury for Wnt3a and beta-catenin western and IHC, respectively. **Results:** Wnt3a protein levels were elevated at 1-month (0.633 ± 0.0540 vs 0.937 ± 0.128) and 2-months post-injury (0.488 ± 0.0170 vs. 0.970 ± 0.232 ; $p < 0.002$) compared to control. Moreover, activated beta-catenin showed a similar increase (0.532 ± 0.0250 vs. 1.050 ± 0.204 ; $p < 0.026$). In contrast to uninjured muscles, Wnt3a staining remained localized at the motor endplate after denervation where it was upregulated near degrading AChRs. **Summary:** Post-synaptic acetylcholine receptors at the NMJ appear to destabilize after denervation injury by a process that involves the Wnt/beta-catenin pathway. Long-term denervation leads to extensive atrophy of the motor endplate, which translates to deficits in functional recovery. Our data implicates the Wnt/beta-catenin pathway as a potential source of motor endplate instability after injury. Our data presents a potential novel target to optimize functional outcomes following surgical management of traumatic nerve injuries.

Keywords: neuromuscular junction; traumatic nerve injury; wnt; denervation

Poster #: 112

The use of Diffuse Optical Spectroscopy in Exercise Physiology and Metabolic Disease

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The goal of these studies is to develop Diffuse Optical Spectroscopy (DOS) for studying vascular function and metabolism in the clinical context of exercise physiology and metabolic disease. In obese and type 2 diabetic populations the greatest direct cause of morbidity is cardiovascular disease. The underlying vascular dysfunction begins sub clinically years or even decades before overt symptomology. To that end, the goal of these preliminary studies is to establish quantitative optical endpoints that can be measured in several different tissue sites- adipose tissue, brain, and exercising muscle. The exercise studies involve the use of incremental cycling tests in children. Oxygenation is measured optically in the muscle and brain, and simultaneous pulmonary exchange data is gathered. We hope to define dynamic patterns such as the point at which brain oxygenation declines during exercise, and correlate such changes with other physiological parameters. One hypothesis is that fatigue will follow a drop in cerebral oxygenation. Other experimental procedures will make use of blood flow restriction in isokinetic exercise. Ultimately, these results will be used in the study of children with obesity, and whether oxygenation dynamics can be used to assess response to training. A second project involves the study of vascular dysfunction using a combination of doppler ultrasound and DOS. Because DOS is sensitive to microvascular perfusion, and doppler ultrasound measures macrovascular flow, the two techniques together when applied to a flow mediated dilation test will provide more complete information. We plan to conduct such studies in normal subjects to quantify the relationship between the two techniques. Finally, we will study changes in oxygenation in subcutaneous adipose tissue that occur with weight loss. Adipose tissue blood vessel density has been identified as a parameter related to metabolic disease risk, and we may be able to assess it optically.

Keywords: Optics; Physiology; Exercise; Metabolism; Adipose Tissue

Poster #: 113

THREE WINDOW BEDSIDE ULTRASOUND VS. CHEST X-RAY FOR CONFIRMATION OF ENDOTRACHEAL TUBE PLACEMENT

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OBJECTIVE : In our study we utilize point-of-care three-window bedside ultrasound (POC-US) to confirm proper endotracheal tube (ETT) placement and compare the results of POC-US to chest x-ray (CXR), the current standard of evaluation for accuracy and time. The hypothesis is that POC-US will be non-inferior to CXR for ETT placement and will be more expedient. **METHODS:** This is a prospective, non-inferiority study comparing the effectiveness of three-window bedside POC-US in confirming placement of ETTs. A convenience sample of critically ill patients that required emergent endotracheal intubation in the intensive care unit (ICU) or the emergency department (ED) at the University of California, Irvine Medical Center have been enrolled. Patients that are >18 years old and require tracheal intubation are eligible for enrollment. Qualified ED and ICU physicians placed ETTs per usual protocol. Ultrasound is then performed to obtain multiple views for confirmation of ETT placement. These include views of the trachea, bilateral lungs, and diaphragms. **RESULTS:** A total of 136 subjects with complete US imaging and CXRs have been enrolled to date with a goal of 140 subjects. The three-window US method correctly identified 124 of 128 ETT placed in the trachea (Specificity 94.7%). US correctly identified 1 of 5 ETTs found by CXR to be in a mainstem bronchus (Sensitivity 20%), with a positive LR of 3.74 and a negative LR of 0.845. **CONCLUSIONS:** Preliminary data suggests that three-window POC-U and CXR have similar agreement for identifying correctly placed ETTs. Additional analysis of subjects with false positive and false negative US impressions will aim to determine factors contributing to these Type I and II errors.

Keywords: Ultrasound; endotracheal tube; emergency department; critical care

Poster #: 114

Use of iPad in Enhancing Teaching during Teaching Rounds: A Qualitative Pilot Study

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Background: iPad usage as a teaching tool in variety of educational settings has been expanding. However, the literature on the use of iPads during in-patient teaching rounds is scant. The purpose of this project is to evaluate the attitudes of medical students and residents regarding the use of iPad during teaching rounds in the hospital. **Methods:** During teaching rounds iPads were used by the attending physician to give short powerpoint presentations, discuss articles and handouts related to patient care, and give short quizzes. After the use of iPads, anonymous evaluation forms were distributed to the housestaff in order to get feedback on use of iPads for educational activities. The housestaff were asked to provide any positive or negative comments on the use of iPads during teaching rounds. Teaching rounds included a total of 4-5 residents and 1-2 medical students. **Results:** We collected surveys from 20 medical students and residents during the pediatric in-patient rotation. The responses were assessed for common themes. Reoccurring themes were quantified based on how many times they came up in survey responses. With regards to utility, common themes identified as strengths of the iPad were: visual aid, timeliness, portability, powerpoint delivery, lack of paper waste and information retrieval. Six of twenty housestaff noted that the iPad technology could be improved by having a larger screen and suggested that the material be “projected.” The major downside of the use of the iPad was that information displayed was not distributed after rounds. **Conclusion:** The use of iPad enhanced teaching by creating a highly engaging teaching environment. Creating a mobile lecture environment whereby no time was lost in transit and decreased paper waste were identified as the major strengths. The small screen to give presentations to large groups and inability to handout the printed information were the major weakness identified. Further data are being collected to identify the exact milieu and optimal use of the iPad during teaching rounds.

Keywords: iPad; Teaching Rounds

Poster #: 115

YIELD AND CLINICAL PREDICTORS OF THORACIC SPINE INJURY FROM CHEST COMPUTED TOMOGRAPHY FOR BLUNT TRAUMA

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Background: A recent decision rule for blunt trauma which informs the decision to perform Chest CT imaging includes thoracic spine tenderness, altered mental status (AMS) and distracting painful injury as potential predictor variables. T spine sagittal reconstruction from chest CT imaging is a separate study which generates technical and professional fees. **Objectives:** To determine test characteristics of predictor variables alone and in combination to postulate derivation of a T spine injury decision rule. **Methods:** Prospective cohort study in single urban Level I Trauma Center with historical 63% incidence of chest CT imaging for trauma activation patients. **Results:** We studied 726 patients with chest CT (of 1099 blunt trauma patients, 66%) who had 21 T spine injuries (2.9%), and recorded these predictor variables. For 623 alert patients, 5 had T spine tenderness among 12 injuries, for sensitivity of 42%, specificity 85%, positive and negative predictive values of 5.2% and 98.7%, respectively. Positive likelihood ratio (+LR) was 2.8, while negative (-LR) was 0.69. Among the 21 T spine injuries, 9 (42.8%) had AMS. Corresponding values for AMS were 42.9%, 86.7%, 8.7%, 98.1%, with +LR 3.2 and -LR 0.66. 13 of 21 (61.9%) had distracting painful injury. Test characteristics were 61.9%, 64.7%, 5.0%, and 98.3%, with +LR 1.75 and -LR 0.59. Combining all these three predictor variables into a proposed decision rule captured 20/21 injuries (the false negative needed no clinical intervention), for test characteristics of 95.2% (95% CI 76.2%-99.9%), 49.1%, 5.3%, and 99.7% (CI 98.4-100%), with +LR 1.87 and -LR 0.10. Such a rule, if validated, would exclude 347/726 patients from T spine imaging (47.8%, CI 44.1-51.5%). Technical charge for each sagittal reconstruction was \$3070 and professional charge for radiologist interpretation was \$242, for combined charge of \$3311 per study. The rule would therefore save as much as \$1.15 million in charges in our population. **Conclusion:** Sagittal reconstructions of T spine from chest CT imaging are of low yield, and generate significant charges. Patients who are alert, have no T spine tenderness and no distracting painful injuries are unlikely to have T spine injury (NPV 99.7% with -LR 0.10). Excluding them from such reconstructive imaging may save considerable charges.

Keywords: blunt trauma; thoracic; chest CT; spine injury; predictors