

# 24<sup>TH</sup> ANNUAL RESEARCH DAY MARCH 20, 2012

Oral and Poster Presentations  
Marshall University Medical Center  
Huntington, West Virginia

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**This event is supported annually by educational grants from the following Endowments:**

Roland H. Burns Memorial  
Anagene Bartram Heiner Memorial  
Thelma V. Owen Memorial  
Richard J. Stevens Memorial

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**No Faculty Disclosure or conflicts of interest are indicated for this CME activity.**

**Disclosure of Conflicts of Interest**

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Completed faculty disclosure forms are on file in the CME Office.



Marshall University Joan C. Edwards School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

## 2012 PROGRAM

The program will consist of a series of oral and poster presentations highlighting basic and clinical research performed by School of Medicine students, residents and fellows. Please use pages 11 through 16, to locate presenters, their abstracts, presentation times and location of presentation. The complete agenda is available at <http://www.musom.marshall.edu>.

### **INTENDED AUDIENCE**

The 24th Annual Research Day is designed for physicians, residents, basic scientists, medical students, graduate students, and other interested health professionals.

### **GOALS**

- 1) To involve faculty, medical and graduate students in the process required to formally present their research in either oral or poster presentations.
- 2) To inform and involve the community in ongoing research at Marshall University Joan C. Edwards School of Medicine.
- 3) To encourage the attitude among faculty, residents, and students for Continuing Medical Education in the area of clinical research.

### **GLOBAL LEARNING OBJECTIVES**

By the end of these lectures the participant will be able to:

- 1) Compare different approaches to medical investigation.
- 2) Compare and contrast the importance of basic research and cellular mechanisms as it relates to human disease.
- 3) Discuss and review research related to current and future improvements in the clinical management of patients.
- 4) Interpret and analyze data for medical investigation to potentially determine the effectiveness towards improving patient care.
- 5) Stress the importance of translational research benefits to the basic scientist in support of the practicing physician.
- 6) Discuss the quality of research in medical education and its application to educational practice in undergraduate and graduate medical education.

**CREDIT STATEMENT**

Marshall University Joan C. Edwards School of Medicine designates this educational activity for a maximum of 5.0 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity. (Session Registration and Evaluation are required).

**EVALUATION FORM Completion**

Please follow specific instructions for completing the bar coded evaluation form. Keep your “X’s” in the bubbles and your written comments in the designated boxes. Your input is needed for planning future events.

**ASSISTED SERVICES**

If special arrangements are required for an individual with a disability to attend these events, please contact Continuing Medical Education at (304) 691-1770 no later than 1 week before the event date or See a CME Representative at the Registration Area on the day of the event.

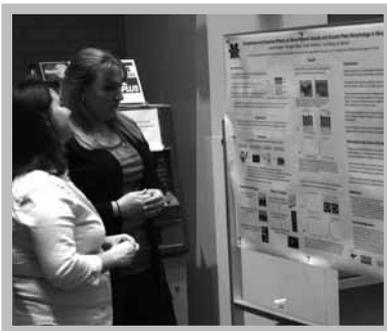
**PLANNING COMMITTEE - NO DISCLOSURE**

- David N. Bailey, MBA, CME
- Todd Gress, MD
- Richard Niles, PhD, Chair
- Darshana Shah, PhD

**STAFF COORDINATORS - NO DISCLOSURE**

- Anita Mathis .....BMS Coordination & Registration
- Patricia “Trish” Martin ....Registration
- Judy Ross .....Web Publications
- Brian Patton .....Online Abstract Submission Form  
Design and Content Retrieval

# RESEARCH DAY



## PAST INVITED LECTURERS

### **2011 – Susan S. Smyth, MD, Ph.D.**

Professor of Medicine  
Director, MD/Ph.D. Program  
University of Kentucky

- 1) *Cardiovascular Complications of Obesity*

### **2010 – Gregory Germino, MD**

Deputy Director of the National Institute of Diabetes and Digestive & Kidney Disease (NIDDK) at the National Institutes of Health (NIH)  
Bethesda, Maryland

- 1) *Dia-besity: converging problems, emerging science*

### **2008 – Gregory Alan Hale, MD**

Associate Professor of Pediatrics  
University of Tennessee

- 1) *Transplantation and Cellular Therapies: Current Research and Future Opportunities*
- 2) *An introduction to Hematopoietic Cell Transplantation*

### **2007 – Daniel D. Bikle, M.D., Ph.D.**

Professor of Medicine and Dermatology  
In residence University of California

- 1) *The skin game: Calcium and vitamin D regulated cellular differentiation*
- 2) *Vitamin D: how much do we need and why*

### **2006 - Mark E. Shirtliff, Ph.D.**

Assistant Professor, Department of Biomedical Sciences  
Dental School, University of Maryland-Baltimore  
Baltimore, Maryland

- 1) *Staphylococcus aureus biofilms: in vitro and in vivo studies*

### **2006 - J. William Costerton, Ph.D.**

Director & Professor, Center for Biofilms, School of Dentistry  
University of Southern California  
Los Angeles, California

- 1) *Biofilms in Device-related and other Chronic Bacterial Diseases*

### **2005 – William F. Balistreri, MD**

Director, Gastroenterology  
Cincinnati Children's Hospital Medical Center

- 1) *Inborn Errors of Bile Acid Biosynthesis*
- 2) *Viral Hepatitis 2005*

### **2004 – Joseph S. McLaughlin, MD**

Professor Emeritus of Surgery  
University of Maryland

- 1) *Traumatic Ruptured Aorta*
- 2) *Strange Tumor I Have Known*

## PAST INVITED LECTURERS

### **2003 – W. Jackson Pledger, Ph.D.**

Professor, Interdisciplinary Oncology  
University of South Florida College of Medicine  
Tampa, Florida

- 1) *Regulation of proliferation by cyclin dependent kinase*
- 2) *Functional genomics and cancer therapy*

### **2002 – Alan H. Jobe, M.D., Ph.D.**

Professor of Pediatrics  
Cincinnati Children's Hospital Medical Center  
Cincinnati, Ohio

- 1) *Mechanisms of lung injury in the preterm*
- 2) *Translational research on lung maturation based on clinical observations*

### **2001 – Arnold Starr, M.D.**

Director, Alzheimers' Research Center  
Institute Brain Research of California, Irvine

- 1) *Hearing but not understanding: auditory nerve dysfunction in the presence of preserved cochlear receptors*
- 2) *Patients' stories and their seminal importance for research*

### **2000–Fredrick L. Brancati, M.D., M.H.S.**

Associate Professor, Medicine and Epidemiology  
John Hopkins Medical Institute

- 1) *Novel risk factors for type 2 diabetes mellitus and their implications for treatment*
- 2) *Prevention and clinical epidemiology in the new millenium*

### **1999 – Robert B. Belshe, MD**

Director and Professor, Div. of Infectious Diseases and Immunology  
St. Louis University

- 1) *Live attenuated influenza vaccine: using genetics to defeat the flu*
- 2) *Vaccines for the 21<sup>st</sup> century*

### **1998 – Jerome S. Brody, MD**

Vice-Chairman of Medicine for Research, Professor of Medicine  
Director, Pulmonary Center  
Boston University School of Medicine

- 1) *Lung development: lesson from flies connections to cancer*
- 2) *Molecular approaches to the diagnosis of lung cancer*

### **1997 – Rochelle Hirschhorn, MD**

Professor of Medicine, Department of Medicine  
NYU School of Medicine

- 1) *Advances in defects in host defense*
- 2) *Reflection on the changing face of medicine*

### **1996 – Stuart F. Schlossman, MD**

Baruj Benacerraf Professor of Medicine  
Harvard Medical School  
Chief, Division of Tumor Immunology  
Dana-Barber Cancer Institute, Boston

- 1) *Human T-cell activation*
- 2) *What's in a name – cd nomenclature*

## PAST INVITED LECTURERS

### **1995 – Frank M. Torti, MPH, MD, FACP**

Director, Comprehensive Cancer Center  
Professor Charles L. Spurr Professor of Medicine  
Section Head for Hematology/Oncology, Wake Forest University  
Chairman, Department of Cancer Biology  
Bowman Gray School of Medicine

- 1) *New pathways for the regulation of iron*
- 2) *Popeye spinach and iron: the politics*

### **1994 – Abner Louis Notkins, MDB**

Director, Intramural Research Program  
Chief, Laboratory of Oral Medicine National Institute of Dental Research,  
National Institutes of Health, Bethesda, MD

- 1) *Polyreactive antibody molecules and matter*
- 2) *The Bethesda experiment*

### **1993 – Erling Norrby, MD, Ph.D.**

Dean of Research and Professor of Virology  
Karolinska Institute, Department of Virology Sweden

- 1) *Immunization against HIV-2/SIV in monkeys*
- 2) *The selection of Nobel Prize winners*

### **1992 – Simon Karparkin, MD**

Professor of Medicine  
New York University School of Medicine

- 1) *Role of thrombin, integrins and oncogenes*
- 2) *How scientific discoveries are made*

### **1991 – Robert M. Chanock, MD**

Chief, Laboratory of Infectious Diseases  
National Institute of Allergy & Infectious Diseases  
National Institutes of Health, Bethesda, MD

- 1) *Epidemiology, pathogenesis, therapy*
- 2) *New approaches to development of treatment plans*

### **1990 – Dewitt S. Goodman, MD**

Director, Institute of Human Nutrition  
Director, Arteriosclerosis Research Center  
Tiden-Weger-Bieler Professor of Preventative Medicine  
Professor of Medicine, Columbia University,  
College of Physicians and Surgeons  
Director, Division of Metabolism and Nutrition  
Department of Medicine  
Columbia-Presbyterian Medical Center, New York  
*Retinoid and retinoid-binding proteins*

### **1989 – Michael A. Zasloff, MD, Ph.D.**

Charles E.H. Upham, Profess of Pediatrics  
University of Pennsylvania School of Medicine  
Chief, Division of Human Genetics & Molecular Biology  
The Children's Hospital of Philadelphia

- 1) *The flow of genetic information*
- 2) *Magainin peptides*

**23RD RESEARCH DAY CONFERENCE PRESENTATION WINNERS**

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**MARCH 21, 2011**

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**THELMA V. OWEN MEMORIAL  
CLINICAL VIGNETTE POSTER WINNER  
Getachew Zeleke**

*"Blindness, Ataxia And Confusion in Waldenstorm's Macroglobulinemia,  
Case Report "*

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**ROLAND H. BURNS MEMORIAL  
CLINICAL SCIENCE POSTER WINNER  
Saba Faiz**

*"Association of Serum Adiponectin and Post Menopausal Hypertension  
in Obese And Lean Women "*

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**ANAGENE B. HEINER MEMORIAL  
BASIC SCIENCE POSTER WINNER  
Aileen J. Marcelo**

*"Modulation of the Blood Brain Barrier (BBB) by Vascular Endothelial  
Growth Factor (VEGF) in Diabetes "*

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**ROLAND H. BURNS MEMORIAL  
CLINICAL SCIENCE ORAL WINNER  
Elke Fahrman**

*"Diabetes Type 1, Cardiovascular Morbidity and Mortality: New Insights "*

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**THELMA V. OWEN MEMORIAL  
CLINICAL VIGNETTE ORAL WINNER  
Sydnee S. McElroy**

*"Copper Deficiency As An Unusual Cause of Peripheral Polyneuropathy "*

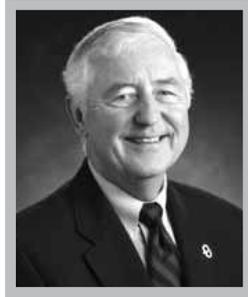
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**ANAGENE B. HEINER MEMORIAL  
BASIC SCIENCE ORAL WINNER  
Anne M. Silvis**

*"Neuroblastoma Differentiation Marker Neurofilament M is Enhanced by  
Silencing of the MnSOD Gene"*

**RICHARD J. STEVENS, MD MEMORIAL LECTURE  
MARCH 20, 2012, 11:30 AM • HARLESS AUDITORIUM  
INVITED LECTURER**

***"Alzheimers Today and the Future"***



**William Theis, Ph.D.**  
*Vice President*  
Medical Scientific Affairs  
Alzheimer's Association  
Chicago, IL

***No Disclosure or Conflicts of Interest***

**Learning Objectives:**

1. List at least three new advances for the treatment of Alzheimer's Disease.
2. Review the rationale for modern drug development in Alzheimer's Disease.
3. List a least two new potential diagnostics for Alzheimer's Disease.

## ABOUT THE RICHARD J. STEVENS, MD MEMORIAL LECTURE

The Richard J. Stevens, MD Memorial Lecture is supported annually by the family of Dr. Stevens. Dr. Stevens was an outstanding medical practitioner characterized by Dean Charles H. McKown, Jr., of the Marshall University Joan C. Edwards School of Medicine as a pioneer “who was never in a hurry but always on the move.”

Born in Portsmouth, Ohio, Dr. Stevens received his undergraduate degree from Marshall University, attended West Virginia School of Medicine for two years, then went on to earn his medical degree from Rush Medical School in Chicago.

Dr. Stevens returned to Huntington in 1941 as one of the first board certified practitioners in internal medicine in the area. He was a member of the Alpha Omega Alpha, the medical honorary, as well as gastroenterology and research societies.

Dr. Stevens was one of three physicians who first researched prothrombin testing for guidance in administering anticoagulants to patients with coronary occlusion.

Remembered as genuinely committed to his profession, his community and those around him, he had the unique ability to bring about a meeting of the minds among colleagues, patients and families.

The memorial lecture is presented each year at the Marshall University Joan C. Edwards School of Medicine’s Research Day. It was established by Dr. Steven’s wife, Dr. Sarah Louise Cockrell Stevens, and their seven children: Chari Louise Stevens Singleton, Mary Alice Stevens, Richard J. Stevens II, Johanna Stevens Holswade, Robert C. Stevens, and Randall C. Stevens.



## PROMOTING EXCELLENCE IN MEDICAL EDUCATION

Since its inception, the Academy of Medical Educators has provided some of our school's most outstanding faculty and residents with a breadth and depth of teaching resources that are taking our educational program to a new level of excellence. To date, 48 members have successfully completed the Academy – 30 Master Educators (faculty) and 18 Teaching Scholars (residents). In addition, the scope of the Academy has grown: by incorporating faculty candidates from the College of Health Professions, it has added an important interdisciplinary dimension; by collaborating with the College of Education and Human Services, it is drawing on expanded resources in the areas of educational theory and innovative educational applications.

## SELF REFLECTION MASTER EDUCATORS, 2011

*"It was my desire to acquire and refine my skills through the program provided by the Academy of Medical Educators. Joining the Academy not only motivates others to learn but teaches them how to acquire the appropriate and necessary knowledge to be an effective, safe and knowledgeable physician, and doing so in a manner that is relevant, meaningful, and memorable."*

Nesreen BenHamed, MD

*"As a participant in the Academy of Medical Educators I had the unique opportunity to spend some protected time focused on my role as educator with colleagues who share my passion for teaching. I found that despite my several years of experience, the exchange of ideas and interactions with faculty and the other participants renewed my thirst for excellence and opened new horizons for me as a teacher and potential researcher. I will always be appreciative of the opportunity to participate in such a quality experience for my personal and professional development."*

Stephen M. Petrany, M.D.

*"I am thankful for the opportunity to have participated in the academy. The interaction and instruction received from national and local academic leaders was rewarding. The educational experience enhanced research as well as teaching skills, and was a motivation for lifelong learning."*

Tina Sias, MD,FACC,FACP,FASNP,FCCP

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No Disclosures or Conflicts of Interest

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## RESEARCH DAY AGENDA

<b>OPENING LECTURES</b>	<b>REGISTRATION</b> <b>Welcome/Introduction - Richard Niles, PhD, Conference Chair</b>	<b>7:00am</b> <b>8:15am</b>
<b>ORAL SESSION I</b>	<b>PAGE 17</b>	
1 Jamie K. Lau	TOBACCO COMPONENTS ACTIVATE THE ACETYLCHOLINE SIGNALING PATHWAY IN BRONCHIOALVEOLAR CARCINOMA	8:30am
2 Flavia De Carlo	Eicosapentaenoic Acid Increases the Sensitivity of Colon Cancer Stem-Like Cells to Chemotherapy	8:42am
3 Clayton M. Crabtree	CAPSAICIN INDUCES APOPTOSIS IN HUMAN SMALL CELL LUNG CANCER VIA THE TRPV PATHWAY	8:54am
4 Johannes Francois Fahrman	Omega 3 Fatty Acids as Potential Chemo-sensitizing Agents in the Treatment of B-Cell Chronic Lymphocytic Leukemia	9:06am
5 Rounak Nande	Comparison of micro-bubble assisted p53, pRb, and p130 gene therapy in combination with radiation therapy in prostate cancer in vitro and in vivo.	9:18am
	<b>Discussion</b>	<b>9:30 am</b>
<b>BREAK</b>	<b>VISIT POSTER SESSION I - ATRIUM • PAGE 43</b>	<b>9:45-10:30am</b>
<b>ORAL SESSION II</b>	<b>PAGE 23</b>	
6 Aaron Dom	MG624, AN ALPHA 7-NICOTINIC RECEPTOR ANTAGONIST, INHIBITS ANGIOGENESIS IN HUMAN SMALL CELL LUNG CANCER	10:30am
7 Alexander H. Slocum, Jr.	Evaluation of Nano-Structured Surface Coatings for Improving Orthopaedic Implant Integration	10:42am
8 Jung Han Kim	SEQUENCE ANALYSIS OF THE TALLYHO MOUSE GENOME	10:54am
9 Christopher David Adams	PERIVASCULAR FAT BIOMARKERS AND CORRESPONDING ECHOCARDIOGRAPHIC EVIDENCE: WV-APPLACHIAN HEART STUDY	11:06am
10 Lauren Thompson	ABUSIVE HEAD TRAUMA IN WEST VIRGINIA IN CHILDREN <2 YEARS OF AGE: A STATEWIDE MULTICENTER ANALYSIS	11:18am
11 William Theis, PhD	Alzheimers Today and the Future	11:30am
	<b>Box Lunch – Visit Poster Exhibits</b>	<b>12:40pm</b>

## RESEARCH DAY AGENDA

### ORAL SESSION III

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12	Michael Chambers	Anterior Cruciate Ligament (ACL) Reconstruction in Obese Patients	1:15Pm
13	Christopher M. Bates	SKIN TEMPERATURES AND PLASTER SPLINT INDUCED THERMAL INJURY IN THE ORTHOPAEDIC PATIENT	1:27pm
14	Adam H. Maghrabi	The impact of automated protocol in management of Diabetic Ketoacidosis	1:39pm
15	Northcutt MJ Al-Subu A	Safety of Infliximab in children with IBD- The experience of a small academic center in West Virginia	1:51pm
16	Yousef Darrat	Outcomes of primary percutaneous Intervention of The unprotected LEFT main coronary artery stenosis in MYOCARDIAL INFARCTION	2:03pm

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### BREAK

**VISIT POSTER SESSION II - ATRIUM • PAGE 77**

**2:30PM 3:15PM**

### ORAL SESSION IV

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17	Christine Gutierrez	EXAMINING OUTCOMES OF METHADONE AND SUBUTEX CONVERSION IN OPIATE-ADDICTED WOMEN DURING PREGNANCY	3:15pm
18	Andrea Lauffer	ENDOSCOPY SUITE EXPLOSION: A RARE COMPLICATION OF A SCREENING COLONOSCOPY	3:27pm
19	Mohamed Alsharedi	CAMPYLOBACTER AS AN UNUSUAL CAUSE OF DIFFUSE GASTROINTESTINAL ULCERS	3:39pm
20	Amanda Pauley,MD & Sarah Price, MD	Obstetrical Emergency Simulator Curriculum	3:51pm
21	Penny G. Kroll, PhD	An Integrated Case-Based Learning Model to Enhance Teaching and Learning	3:58pm
22	Dana Eilen	Multidisciplinary Perceptions of the Efficacy of Physician to Physician Transition of Care: current practice and changes in perceptions post policy intervention.	4:05pm
23	Wesamb Bolkhir, MD	Resident research curriculum, Multiple approach for resident research education	4:12pm

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**AWARDS PRESENTATION**

**CONCLUSION AND EVALUATION**

**4:30PM**

## RESEARCH DAY AGENDA

PRESENTER	POSTER PRESENTATIONS SESSION I, ATRIUM • PAGE 43	9:45AM-10:30AM
1 M. Allison Wolf	BENZYL ISOTHIOCYANATE TARGETS CHEMORESISTANT AND METASTATIC HEAD AND NECK SQUAMOUS CELL CARCINOMA CELLS	9:45am-10:30am
2 Meagan Valentine	Chmp1 protein regulates wing vein development in <i>Drosophila</i>	9:45am-10:30am
3 Sumaiya Chaudhry	DISCRETE SENSORY ENCODING OF FORCE INCREASES OR DECREASES IN THE STICK INSECT LEG	9:45am-10:30am
4 Omar Akhtar	EFFECT OF DIMETHYL SULFOXIDE ON BONE HEMOSTASIS WITH OBESITY	9:45am-10:30am
5 Miranda Carper	Finding a bridge that connects the p53 and pRb tumor suppressor pathways	9:45am-10:30am
6 Ashu Dhanjal	Intratracheal instillation of the cerium oxide nanoparticles may induce cardiac alterations in the male Sprague-Dawley rats.	9:45am-10:30am
7 Vishnu Garla	A RARE CASE OF CUSHINGS IN PREGNANCY	9:45am-10:30am
8 Marc Hettlinger	A Case of an ACTH-Producing Pheochromocytoma	9:45am-10:30am
9 Youhana Greges	A CASE OF ANAPLASMOSIS IN SOUTHERN OHIO	9:45am-10:30am
10 Arun Manoharan	A case of confusion	9:45am-10:30am
11 Getachew Zeleke	A mass in the Ascending aorta, in a 40 year old patient with history of recurrent thromboembolism	9:45am-10:30am
12 Adam Maghrabi	Adrenal venous sampling: an unusual method for investigating bilateral adrenal masses	9:45am-10:30am
13 Heidi Michael	Advanced Endometrial Adenocarcinoma In a 32 Year-Old Nulliparous Woman	9:45am-10:30am
14 Ashu Dhanjal, Carrie Willis,	Atriobronchial fistula: rare complication of atrial fibrillation ablation	9:45am-10:30am
15 Joaquin Llado	BLOODY...!, HEMATURIA SECONDARY TO ALPHA 2-ANTIPLASMIN DEFICIENCY	9:45am-10:30am
16 Kevin Johnson	Candida meningitis in a young man with history of Diabetes Mellitus and intravenous drug abuse	9:45am-10:30am
17 Jill Hopkins	CANDIDA ZEYLANOIDES: CASE REPORT AND REVIEW OF THE LITERATURE	9:45am-10:30am
18 Arafa Ayah	CRYPTOCOCCUS LAURENTII FUNGEMIA IN AN IMMUNOCOMPROMISED HOST	9:45am-10:30am
19 Lauren Bevins & Qiaoling He	DELIRIUM SECONDARY TO POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME.	9:45am-10:30am
20 Mohamed Alsharedi	Dermatologic lesions arise in patients being treated for cancer; they may represent a side effect of therapy	9:45am-10:30am
21 Allison Hamilton	Diagnosis and Management of Preeclampsia	9:45Am-10:30am
22 Mahshid Mohseni	Dopamine Agonist Resistant Prolactinoma: An unusual case of prolactine producing pituitary macroadenoma unresponsive to medical treatment with high dose dopamine agonists	9:45am-10:30am

## RESEARCH DAY AGENDA

23	Vishnu Garla	DOUBLE BLOW: OPTIC NEURITIS AND PORN (PERIPHERAL OUTER RETINAL NECROSIS) IN A HIV PATIENT	9:45am-10:30am
24	Stephen Cole	ETANTR: A Rare Embryonal Brain Tumor	9:45am-10:30am
25	Youhana Greges	FOREIGN BODY GRANULOMATOSIS IN INJECTION DRUG USERS	9:45am-10:30am
26	Brittany L. Venci	Guidelines for the Management of Antithrombotics and Antiplatelets in Nonoperative Head Injured Patients: A Case Study and Literature Review	9:45am-10:30am
27	Adam Maghrabi	Hemiballism-Hemichorea: A Rare Manifestation Of Diabetic Ketoacidosis	9:45am-10:30am
28	Gordon McLemore	Hepatocellular Carcinoma	9:45am-10:30am
29	Eric Carter	HEREDITARY NEPHRITIS (ALPORT SYNDROME) PRESENTING IN A MIDDLE AGED WOMAN AS CRAMPS	9:45am-10:30am
30	Vishnu Garla	ISCHEMIC STROKE AFTER MINOR HEAD TRAUMA IN A 19 MONTH OLD: A UNIQUE MECHANISM OF STROKE	9:45am-10:30am
31	Ashleigh Keats	Myasthenia Gravis in Pregnancy	9:45am-10:30am

<b>PRESENTER</b>	<b>POSTER PRESENTATIONS SESSION II</b>	<b>2:30PM-3:15PM</b>
	<b>ATRIUM • PAGE 77</b>	

32	Vishnu Garla	PAPILLEDEMA AND INCREASED IODINE UPTAKE IN THE EYE: A RARE COMPLICATION AND A UNIQUE PRESENTATION	2:30pm-3:15pm
33	Dana Lycans	PATTERN RECOGNITION: A CASE OF ISOLATED POSTERIOR MYOCARDIAL INFARCTION	2:30pm-3:15pm
34	Eyad Nazer	PEPTO BISMUTH INDUCED NEUROTOXICITY: RARE SIDE EFFECTS OF A COMMONLY USED MEDICATION	2:30pm-3:15pm
35	Mahshid Mohseni	Radiation Associated Pelvic Fractures: Report of Four Cases	2:30pm-3:15pm
36	Hani Alkhankan	Rare case of Pituitary adenoma co secreting TSH and GH	2:30pm-3:15pm
37	Tilahun Belay	Relapse after 40 years, Follicular non-Hodgkin's lymphoma reoccurring after 40 years from treatment	2:30pm-3:15pm
38	Mahshid Mohseni	RESISTANT PROLACTINOMA: AN UNUSUAL CASE OF PROLACTINOMA UNRESPONSIVE TO MEDICAL TREATMENT WITH HIGH DOSE DOPAMINE AGONISTS	2:30pm-3:15pm
39	Lisa Bajpayee	SEVERE PANCYTOPENIA SECONDARY TO VITAMIN B12 DEFICIENCY	2:30pm-3:15pm
40	Hani Alkhankan	Streptococcus pneumoniae Bacteremia/Septicemia	2:30pm-3:15pm
41	Gargi Bajpayee	SUPERIOR VENA CAVA SYNDROME: Concurrent COPD confounds the prompt diagnosis of SVC Syndrome	2:30pm-3:15pm
42	Ayah Arafa Supra Batra	Takotsubo Syndrome in a Postmenopausal Female	2:30Ppm-3:15pm

## RESEARCH DAY AGENDA

PRESENTER	POSTER PRESENTATIONS SESSION II ATRIUM	2:30PM-3:15PM
43 Rezwan Ahmed	UNCOVERING THE MYSTERY OF A LIP SWELLING, AN EXTRAGINGIVAL PYOGENIC GRANULOMA	2:30pm-3:15pm
44 Kari Wilson	VARICELLA ZOSTER VIRUS MENINGITIS IN A IMMUNOCOMPETENT HOST: A CASE REPORT OF AN UNEXPECTED ETIOLOGY	2:30pm-3:15pm
45 Daniel Woods	Anatomy of Syndesmotic Cartilage: Where can a syndesmotic screw be placed to avoid damage to the syndesmosis cartilage?	2:30pm-3:15pm
46 Joshua Hendrix, Sammy Hodroge, Adam Short	Antibiotic like actions of Vitamin D	2:30pm-3:15pm
47 Ahmad R. Nusair	Are the Defining Markers of SIRS Associated with the Isolation of Pathogenic Bacteria?	2:30pm-3:15pm
48 Elke Fahrman	Associated findings in the patient with DKA: A wake up call	2:30pm-3:15pm
49 Kimberly Weaver	Community Hospital Experience With SILS Cholecystectomy	2:30pm-3:15pm
50 Farah Al khitan	Comparison of pulmonary uptake with transient ischemic dilation after Regadenoson Technicium-99 perfusion imaging	2:30pm-3:15pm
51 Melissa Goetter	Evaluation of Stillbirth	2:30pm-3:15pm
52 Dana Lycans	EXTRASKELETAL EFFECTS OF VITAMIN D: POTENTIAL IMPACT ON WV DISEASE MORBIDITY AND MORTALITY	2:30pm-3:15pm
53 Thomas Schlierf	Fall Prevention Therapy: Vitamin D Supplementation	2:30pm-3:15pm
54 Megan D. Powers	LOWER RADIATION EXPOSURE FROM MUSCULOSKELETAL COMPUTERIZED TOMOGRAPHIC SCANS MAY MEAN LOWER CANCER RISK FOR PATIENTS	2:30pm-3:15pm
55 Rebecca Klug	Neuroprotective Effects of Progesterone in Treating Traumatic Brain Injury	2:30pm-3:15pm
56 Sarah Mathis	Personalized chemotherapy identified for a case of recurring spinal ependymoma	2:30pm-3:15pm
57 Piyush Sovani	Preventive Care Services and Dementia	2:30pm-3:15pm
58 Ken Maynard	QUANTITATIVE ANATOMY OF THE LUMBAR INTERVERTEBRAL DISC PART 1	2:30pm-3:15pm
59 Mohamed Foda	Retrospective chart review of single physician/institute experience with robotic gynecologic surgery to determine impact on rate and reason for abdominal hysterectomies	2:30pm-3:15pm
60 Vishnu Garla	THE IMPACT OF COMPUTER ASSISTED LEARNING IN PEDIATRICS PROGRAM (CLIPP) CASES ON PEDIATRIC MINIBOARD SCORES	2:30pm-3:15pm
61 Richard G. Erwin	A unique global health didactic course for preclinical medical students at Marshall University	2:30pm-3:15pm
62 Awani Al-Subu, Mohammed Ebraheem, Susan Flesher	National Pediatric Nighttime Curriculum Filed Test	2:30pm-3:15pm



ORAL SESSION I • 8:15 AM – 9:30 AM

# 24TH ANNUAL RESEARCH DAY ORAL SESSION

## **TOBACCO COMPONENTS ACTIVATE THE ACETYLCHOLINE SIGNALING PATHWAY IN BRONCHIOALVEOLAR CARCINOMA**

Jamie K. Lau

Department of Pharmacology, Physiology, and Toxicology, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV

Bronchioalveolar carcinomas (BACs) are highly aggressive tumors that are relatively chemoresistant and show an association with smoking. Nicotine, the major active and addictive component of cigarettes, accelerates cell proliferation and angiogenesis through nicotinic acetylcholine receptors (nAChRs). Acetylcholine (ACh) can act as an autocrine growth factor in small cell lung cancer and squamous cell carcinoma; however, the role of this proliferative cholinergic loop in BACs is unknown.

ACh production was measured using the Choline ELISA kit. Western blotting analysis and an ELISA was used to determine the expression of proteins involved in the ACh signaling pathway, namely vesicular acetylcholine transporter (VACHT), choline transporter 1 (CHT1) and acetylcholinesterase (AChE). The antitumor activity of vesamicol (an antagonist of VACHT) was examined in nude mice models.

We show for the first time that acetylcholine (ACh) stimulates proliferation of A549 and H358 human bronchioalveolar carcinoma (BAC) cells. The maximal proliferation of human BACs was observed at 2  $\mu$ mol. Furthermore, we observed that nicotine induced the production of ACh in a concentration and timedependent manner. The prosecretory activity of nicotine was mediated via  $\alpha$ 7 and  $\beta$ 3containingnAChRs. Western blotting and ELISA analysis indicates VACHT, CHT1 and AChE are expressed on A549 and H358 human BACs. Nicotine increased the levels of VACHT in human BACs. Finally, VACHT antagonist vesamicol decreased the growth rate of A549 human BAC tumors xenotransplanted in nude mice.

Our observations raise the possibility that tobacco components like nicotine promote the growth of human BACs by stimulating ACh production and VACHT levels. Further, the disruption of this cholinergic pathway by agents like vesamicol may have applications in BAC therapy.

## **EICOSAPAENTENOIC ACID INCREASES THE SENSITIVITY OF COLON CANCER STEMLIKE CELLS TO CHEMOTHERAPY**

Flavia De Carlo

McKown Translational Genomic Research Institute, Marshall University,  
Joan C. Edwards School of Medicine, Huntington, WV

Diets high in fat especially from animal sources are emerging as one of the major causes of colon cancer. Recent *in vitro* and *in vivo* experiments have linked n3 polyunsaturated fatty acids (PUFAs) to attenuated cell proliferation of various types of cancers, including colon. Additionally, n3 PUFAs have been shown to increase the efficacy of various cancer chemotherapy drugs *in vitro* as well as *in vivo*. However, all these studies addressed the effects of n3 PUFA treatments on the bulk of tumor cells, NOT on the colon Cancer StemLike Cells (CSLCs). Colon CSLCs are a rare and undifferentiated CD133(+) cellular population, responsible for tumor formation, resistance to chemotherapy, and tumor relapse following failed therapy.

The Effects of Eicosapaentenoic Acid (EPA) on Colo320DM cell proliferation and CD133 expression was determined by viable cell count and FACS analysis. EPA incorporation into the FAs of the treated colon cancer cells was evaluated by gas chromatography. CD133 and CK20 expression was studied by RealTime PCR and western blot analysis. CD133(+) colon CSLCs were magnetically sorted, treated with EPA and subsequently with CPT11 or 5Fluorouracil to assess their sensitivity to therapy with respect to the total cellular population.

We have demonstrated that EPA was incorporated into the fatty acids of the treated Colo320DM cells. Lower physiological concentrations (2550 $\mu$ M) of EPA decreased the number of the overall tumor cells, while the CD133(+) CSLCs resulted affected only by higher EPA concentrations (100 $\mu$ M). Moreover, colon cancer cells cultured with EPA exhibited lower CD133 protein expression and higher CK20 mRNA expression than without EPA, indicating increased differentiation. We also demonstrated that EPA increased the sensitivity of CD133(+) Colo320DM cells to chemotherapy. EPA affected the proliferation and increased the sensitivity to chemotherapy of colon CSLCs, paving the road to future targeted dietary interventions during chemotherapy regimens for colon cancer patients.

## **CAPSAICIN INDUCES APOPTOSIS IN HUMAN SMALL CELL LUNG CANCER VIA THE TRPV PATHWAY**

Clayton M. Crabtree

Department of Pharmacology, Physiology, and Toxicology, Department of Biochemistry and Microbiology, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV 25755

Small cell lung cancer is an aggressive malignancy with a dismal survival rate. The present study examines the anticancer activity of capsaicin, (the spicy ingredient of chili peppers) in SCLC.

MTT assays were performed to determine the effect of capsaicin on the viability of human SCLC. The apoptotic activity of capsaicin was measured in human SCLC cells and in normal lung cells, using TUNEL (terminal deoxynucleotidyl transferase dUTP nick end labeling) and the caspase3 activity assay. Subsequently, we tested the anticancer activity of capsaicin in vivo in nude mice models. The present study also analyzed the signaling pathways underlying the apoptotic activity of capsaicin. The biological activity of capsaicin is mediated by the receptors. The role of TRPV receptors was analyzed by siRNA methodology.

MTT assays showed that capsaicin decreased the viability of human SCLC cells in a concentrationdependent manner and timedependent manner. We show that capsaicin induced 56 fold apoptosis in a panel of human SCLC cell lines, but did not affect normal human lung epithelial cells. The dietary administration of capsaicin decreased the growth H69 and DMS53 human SCLC tumors xenotransplanted in nude mice. Most importantly, the dietary administration of capsaicin was not associated with any discomfort in mice. The apoptotic activity of capsaicin was independent of TRPV1, the classical receptor for capsaicin. However, depletion of TRPV6 by siRNA ablated the apoptotic activity of capsaicin.

Our findings suggest that capsaicin may have potential applications as a novel agent for management and therapy of human SCLCs.

## **OMEGA 3 FATTY ACIDS AS POTENTIAL CHEMOSENSITIZING AGENTS IN THE TREATMENT OF BCELL CHRONIC LYMPHOCYTIC LEUKEMIA**

Johannes Francois Fahrmann  
Marshall University School of Medicine

Omega3 fatty acids (n3) have consistently been shown to increase the efficacy of anticancer drugs invitro and invivo. Previous results from our human study indicated that consumption of an omega 3 supplement, predominantly containing eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), increased sensitivity of malignant B lymphocytes from asymptomatic CLL patients to doxorubicin invitro. The purpose of the current study is to further elucidate the role of n3 as potential chemosensitizing agents for the treatment of Bcell malignancies, including CLL. Increased sensitivity is clinically relevant and would lead to increased drug efficacy, and decrease in drug dosage resulting in improved quality of life and reduced druginduced toxicities.

Three Bcell leukemic cell lines (EHEB, JVM2, and Raji) were tested for invitro doxorubicin or fludarabine sensitivity in the presence or absence of vehicle, EPA or DHA. Respective cell lines were treated for 72 hours in the presence or absence of vehicle, EPA or DHA. Following 72 hours, respective cell lines were treated for 20 hours with doxorubicin ( $07.5\mu\text{M}$ ) or fludarabine ( $050\mu\text{M}$ ). Cell Viability was determined using standard MTT assay. Experiments were performed in triplicate.

N3 increased sensitivity in all three cell lines to doxorubicin. Increased sensitivity to fludarabine was observed in Raji and EHEB but not JVM2. EPA and DHA had differential responses on enhanced doxorubicin and fludarabinesensitivity.

N3 increased the invitro sensitivity of malignant Blymphocytes to doxorubicin and fludarabine. Differential responses on enhanced chemosensitivity by EPA or DHA indicate that the mode of action differs between these two fatty acids. It would be of great interest to elucidate the mechanisms by which EPA or DHA increase sensitivity of malignant B lymphocytes to anticancer drugs. Results provide insight into the use of n3 as to augment the treatment of Bcell malignancies, including CLL, and warrants further investigation.

**COMPARISON OF MICROBUBBLE ASSISTED P53, PRB, AND P130 GENE THERAPY IN COMBINATION WITH RADIATION THERAPY IN PROSTATE CANCER IN VITRO AND IN VIVO.**

Rounak Nande

- (1) Joan C. Edwards School of Medicine, Marshall University, Huntington
- (2) TriState Regional Cancer Center, Ashland

There are limited options for patients with therapy resistant prostate cancer. The ineffectiveness of current treatments is due to loss or mutation in p53 and/or pRB. We used a novel approach using adenoviral (Ad) delivery of cell cycle proteins encapsulated inside microbubbles (MBs), in combination with radiation to target p53 and pRB mutant prostate cancer cells. MBs deliver effective therapeutic Ads, combined with ultrasoundtargeted microbubble destruction (UTMD), allowing for a sitespecific gene transfer system.

DU145 radioresistant human prostate cancer cells were exposed to 10 and 20Gy of xray radiation in vitro. Immediately after irradiation, cells were transduced with Ads carrying p53, pRb, or p130. Cell death was evaluated by flow cytometry and AnnexinV assay between 24-96hours.

DU145 tumors were grown to a volume of 200 mm<sup>3</sup> in nude mice in their flanks. Mice were treated with intravenous injections of the Ads, each at concentration of 10<sup>4</sup> pfu/ $\mu$ L,  $\pm$  MB. Intravenous treatments were compared to intratumoral injections of the Ads. Combinational therapy groups were irradiated at 8Gy, and injected intravenously with MB/Ads  $\pm$  ultrasound, every week for 4 weeks. Gene transfer was confirmed by western blot analysis.

In vitro, a higher percentage of cell death was observed in 20Gy vs. 10Gy irradiated cells. Cells transduced with adenoviruses carrying RB, p53, and p130 showed a decreasing order of cell death. Combination of radiation and p53 or RB Ads treatments showed increased cell cycle G1 arrest, while p130 combination treatments demonstrated G0 arrest when compared to control Ad or radiation alone.

Statistically significant ( $p < 0.05$ ) reduction of the ultrasoundtargeted MB/p53 or RB Ad transduced tumors was observed when compared to intratumoral treatments or radiation alone. Ultrasound targeted MB/Ads in combination with xradiation therapy resulted in the most efficient treatment.

Combination treatments of radiation and UTMD increase the treatment potential of therapy resistant prostate cancer.



**ORAL SESSION II • 10:30 AM – 11:42 AM**

# **24TH ANNUAL RESEARCH DAY ORAL SESSION**

## **MG624, AN ALPHA 7NICOTINIC RECEPTOR ANTAGONIST, INHIBITS ANGIOGENESIS IN HUMAN SMALL CELL LUNG CANCER**

Aaron Dom

(1) Marshall University Joan C. Edwards, (2) AldersonBroaddus College, (3) West Virginia University

Small cell lung cancer (SCLC) demonstrates a strong etiological association with smoking. Nicotine is the addictive component of cigarette smoke. Nicotine promotes angiogenesis in lung cancers via the alpha 7nicotinic acetylcholine receptor (alpha 7nAChR) on endothelial cells. Therefore, we conjectured that alpha 7nAChR antagonists may attenuate nicotineinduced angiogenesis and be useful for the treatment of human SCLC. For the first time, our study explores the antiangiogenic activity of MG624, a smallmolecule 7nAChR antagonist, in several experimental models of angiogenesis.

The antiproliferative activity of MG624 was measured by BrdU and PCNA assays in primary human microvascular endothelial cells of the lung (HMECLs). The antiangiogenic activity of MG624 was analyzed in Matrigel, rat aortic ring, retinal explant assays, chicken chorioallantoic membrane (CAM) model and the nude mice model. The effect of MG624 on FGF2 and VEGF levels was assessed by ELISA. Finally chromatin immunoprecipitaion (ChIP) assays were performed to study the differential occupancy of early growth gene (Egr1) on the FGF2 promoter.

We observed that MG624 potently suppressed the proliferation of HMECLs. Furthermore, MG624 displayed robust antiangiogenic activity in the Matrigel, rat aortic ring and rat retinal explant assays. MG624 inhibited angiogenesis of human SCLC tumors in CAM and nude mice models. Most importantly, the administration of MG624 was not associated with any toxic side effects, lethargy or discomfort in the mice. The antiangiogenic activity of MG624 was mediated via the suppression of nicotineinduced FGF2 levels in HMECLs. MG624 decreased nicotineinduced early growth response gene 1 (Egr1) levels in HMECLs, and reduced the levels of Egr1 on the FGF2 promoter. Consequently, this process decreased FGF2 levels and angiogenesis.

Our findings suggest that the antiangiogenic effects of MG624 could be useful in antiangiogenic therapy of human SCLCs.

## EVALUATION OF NANOSTRUCTURED SURFACE COATINGS FOR IMPROVING ORTHOPAEDIC IMPLANT INTEGRATION

Alexander H. Slocum, Jr.

1 Joan C. Edwards School of Medicine, Marshall University, Huntington, WV 25755, 2 Department of Biomedical Sciences, Marshall University, Huntington, WV 25755, 3 Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, 4 Department of Civil and Environment Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139

Application of porous coatings to the surfaces of orthopaedic implants can lead to improved patient outcomes by increasing integration of the implant into the surrounding bone. This can help to reduce the incidence of aseptic loosening or other periprosthetic causes of implant failure. One method currently in use of fabricating porous coatings is plasma spraying of titanium or hydroxyapatite onto the smooth surface of an implant. While this is one of the more popular methods of manufacturing porous coatings, it is subject to several limitations, including delamination of the porous layer from the substrate, and the release of particles into the body.

A porous coating fabricated directly into the surface of an implant would significantly reduce the potential for delamination, and hierarchical materials with combined micron/submicronscale features have been shown to lead to improved cellular proliferation. Porous oxide coatings, which satisfy both of these functional requirements, were etched into 25mmx25mmx6mm Ti6Al4V samples via immersion in a 10M solution of NaOH at 80°C for 28 hours. Nanoindentation tests were performed to verify the predicted mechanical properties of the coating. Etched and nonetched samples were then plated with mouse MC3T3 cells obtained from ATCC (Rockville, MD), and cultured in growth medium at 37°C.

Formation of a TiO<sub>2</sub> porous coating via NaOH etching supports osteoblast proliferation. The elastic modulus of the coating as measured by nanoindentation tests correlated well with the theoretically predicted value.

We have demonstrated a method of predicting the elastic modulus of a porous coating which also enables osteoblast proliferation. This will support development of coatings fabricated directly into the surface of implants to be tested in vivo. It is the intent of further work to demonstrate that the risk of delamination has been significantly mitigated while retaining the benefits of existing technology.

## SEQUENCE ANALYSIS OF THE TALLYHO MOUSE GENOME

Jung Han Kim

Dept. of Pharmacology, Physiology & Toxicology, Biochemistry & Microbiology Joan C. Edwards School of Medicine

The TALLYHO/Jng (TH) mouse is an inbred polygenic model for Type 2 diabetes characterized by glucose intolerance, diabetes, obesity, insulin resistance, hyperinsulinemia, and hyperlipidemia. Genetic outcross experiments with lean nondiabetic strain of C57BL/6 (B6) mice revealed major susceptibility loci for obesity on chromosome 6 (Tabw2) and for diabetes on chromosome 4 (Tanidd4). For these loci, the TH alleles are associated with disease susceptibilities. Currently, the obesity Tabw2 locus has been fine mapped to 8Mb interval and the diabetes Tanidd4 locus to 15.8Mb interval.

We performed whole genome sequencing of the TH mouse genome in two 2 x 100 paired end strategies using an Illumina HiSeq1000 next generation sequencer. Libraries were prepared using Illumina Paired End DNA Sample Prep Kit; clusters were assembled onto flow cells using Illumina Paired End Cluster reagents and sequenced using TruSeq Sequencing Reagents.

In two runs on the HiSeq1000, we generated ~60 gigabases of TH sequence with an average coverage of ~25X. Seventy five % of the readout aligned to the mouse reference B6 genome (Build 37). In our initial test of the whole genome sequence data, we compared the TH genome to the B6 genome using Illumina CASAVA software and identified 4,749,554 SNPs and 292,975 indels. Among these, 38,147 SNPs were mapped to the Tabw2 interval and 83,122 SNPs to the Tanidd4 interval.

In conclusion, we applied wholegenome sequencing strategy in combination with mapping data to identify the molecular defects in the obese and diabetic TH mice. Further defined and systemic filtrations of the variants between TH and B6 genomes will facilitate identification of the diseasecausative variants.

## **PERIVASCULAR FAT BIOMARKERS AND CORRESPONDING ECHOCARDIOGRAPHIC EVIDENCE: WVAPPLACHIAN HEART STUDY**

Christopher David Adams

Dept. Cardiovascular Services; Dept. Pharmacology, Physiology, & Toxicology, Dept. Cardiothoracic Surgery, St. Mary's Heart Center, Joan C Edwards School of Medicine, Marshall University, Huntington, WV

Obesity, a growing health crisis, predisposes one to increased risk to cardiovascular disease. The Appalachian region of the United States has the highest incidence of obesity. Perivascular adipose tissue (PVAT) (fat surrounding the heart and arteries) plays an important pathophysiological role in coronary artery disease (CAD). Identification of PVAT associated biomarkers will have a potential therapeutic impact as would quantifying the amount of perivascular fat.

Blood, epicardial or perivascular and subcutaneous fat were obtained from IRB consented men and women undergoing either coronary artery bypass graft (CABG) surgery for CAD or valve surgery at the St. Mary's Heart Center, Huntington, West Virginia (IRB approved). Biomarkers such as (i) cytokine profile using multiplex cytokine array (ii) miRNA array and (iii) validation of miRNA and mRNA by real time PCR were performed in all samples. Echocardiograms were performed on all patients with multiple views of the epicardial fat pad and measurements of the fat pad taken.

Bivariate analysis of the cytokine/chemokine array revealed significant differences in levels of tumor necrosis factor alpha ( $p=0.02$ ), granulocyte colony stimulating factor ( $p=0.001$ ), IL17 ( $p=0.03$ ) and macrophage inflammatory protein 1 beta ( $p=0.052$ ) between male and female patients with CAD. Pathway analysis using Ingenuity software identified unique miRNAs differences between males and females that correlated to CAD. Correlation of these biomarkers to other clinical parameters (source: Society of Thoracic Surgeons database) of the patient along with the measurements of the fat pad are currently underway.

Our results so far have identified unique PVAT specific biomarkers in patients with CAD with possible therapeutic importance. We have also found important correlations with these markers that correspond to the size of each patients' epicardial fat pad that can be measured noninvasively.

## **ABUSIVE HEAD TRAUMA IN WEST VIRGINIA IN CHILDREN <2 YEARS OF AGE: A STATEWIDE MULTICENTER ANALYSIS**

Lauren Thompson

(1) Pediatrics, Charleston Area Medical Center/West Virginia University – Charleston Division, Charleston, WV, (2) Pediatrics, West Virginia University, Morgantown, WV, (3) Pediatrics, Marshall University, Huntington, WV, (4) Outcomes Research, Charleston Area Medical Center, Charleston, WV

This research seeks to define the epidemiology of Abusive Head Trauma (AHT) in infants and young children in West Virginia between 1999 and 2009. Recent work in California and North Carolina indicates the usefulness of hospital record review to define incidence and other epidemiologic factors.

This retrospective study examined all hospital visits for children <2 years old admitted to the three tertiary centers in WV that have pediatric intensive care units. Cases were identified from hospitalizations with assigned diagnostic codes consistent with AHT. A data collection instrument was developed and used across institutions to promote uniformity. Statewide incidence was estimated using census data.

Ninetyfive cases of AHT were identified. Preliminary results included: 1) victims were predominantly white (90.2%) with a mean age 5.9 months ( $\pm 5.2$ ); 2) 67.4% of patients were <6 months; 3) the most common presenting symptoms were seizures (42.1%), vomiting (41.1%), and unresponsiveness (40%); 4) retinal hemorrhages were present in 70.5%; 5) fractures were found in 46.3%; 6) intracranial hemorrhage was present in 95.8% with evidence of prior chronic subdural hematoma in at least 30% at acute presentation; 7) mortality was 12.6%. The incidence is 20.7/100,000 live births during our initial study period (19992005); it is 46.7/100,000 in 20062009. The overall incidence of AHT in infants (<12 months) was 30.3/100,000 live births and for all cases (<24 months) was 17.1/100,000.

WV incidence of AHT from 19992009 exceeds that of a comparable California study, and is similar to that in North Carolina, where efforts at prevention are well underway. Given this, particularly in light of the apparent increase in incidence during recent years, our study provides support for institution of AHT prevention efforts in WV. Such programs should begin in the postpartum period, given that most cases in our population occurred <6 months of age.



**ORAL SESSION III • 1:40 PM – 2:40 PM**

**24TH ANNUAL  
RESEARCH DAY  
ORAL SESSION**

## ANTERIOR CRUCIATE LIGAMENT (ACL) RECONSTRUCTION IN OBESE PATIENTS

Michael Chambers

Marshall School of Medicine

There is a paucity of data describing anterior cruciate ligament (ACL) injury and reconstruction in the obese patient population, with a bias toward nonoperative treatment. The purpose of this study was to characterize the unique features of ACL injury and reconstruction in obese patients.

We conducted a retrospective cohort analysis of 131 patients with an ACL injury treated with ACL reconstruction from November, 2007 to March, 2011. Thirtytwo obese patients (BMI >30) were identified (Group 1) and compared with 99 nonobese control patients (Group 2). Fisher's exact test, Wilcoxon test, and multivariate logistic regression analyses were performed with respect to various parameters.

The mean BMI was 35 (range 30 – 54) in Group 1 vs 24 (range 16 – 29) in Group 2. Forty percent of patients in Group 1 sustained a low energy mechanism of injury compared with 14% in Group 2 (OR = 4,  $p = 0.004$ ). Fiftysix percent of patients in Group 1 experienced at least two episodes of symptomatic instability prior to undergoing ACL reconstruction vs 32% of patients in Group 2 ( $p = 0.02$ ). The diagnosis of osteochondral injury (Outerbridge grade  $\geq 3$ ) was 56% in Group 1 vs 16% in Group 2 ( $p = 0.0001$ ).

Anterior cruciate ligament injury in obese patients is characterized by a lowerenergy mechanism of injury, a greater degree of symptomatic instability with nonoperative management, and a higher incidence of highgrade osteochondral lesions on arthroscopic evaluation. Although these individuals do not match the current or desired future activity level profile of the typical patient undergoing ACL reconstruction, challenges the bias toward nonoperative treatment and recommend surgical consideration. In our experience, nonoperative management in this sedentary cohort often leads to episodes of instability with activities of daily living and may predispose to the earlier onset of degenerative joint disease.

## **SKIN TEMPERATURES AND PLASTER SPLINT INDUCED THERMAL INJURY IN THE ORTHOPAEDIC PATIENT**

Christopher M. Bates

Joan C. Edwards School of Medicine, Department of Orthopaedic Surgery, Huntington, WV.

Thermal injury can result from plaster cast application; however, there is no data describing skin temperatures achieved with splinting in the acute management of orthopaedic trauma. It is concerning that the soft tissues requiring splints may be at an increased risk of thermal injuries, thus the purpose of this study was to evaluate skin temperatures generated during splint application. We hypothesize that deviation from the manufacturer's protocol may produce increased thermal injury to traumatized soft tissues.

Short leg posterior splints were applied to noninjured extremities in two volunteers. Two conditions were evaluated. One was using manufacturer recommendations of 8 plies and 23.9°C water. The second was the current practice of 10 plies and 35°C water. A monotherm thermistor was affixed to the posterior calf and was elevated on plasticcovered urethane pillows in cotton pillowcases, ice pack covered cotton blankets, or heel elevation for free air circulation. Skin and plaster temperatures were recorded at oneminute intervals. The maximum skin temperature and the average time skin temperature was greater than or equal to onset of discomfort at 40°C is reported.

An increased thermal insult was generated using a differing technique from protocol by adding 2 plies and lukewarm water. No burns were noted. Temperatures of 42°C produced discomfort while temperatures of 47°C produced extreme discomfort and skin erythema. This demonstrates that a decrease in exposure time to temperatures greater than or equal to 40°C is achieved by air cooling and cryotherapy with concomitant extremity elevation.

Following manufacturer protocol is a necessity. The use of blankets and pillows for extremity elevation following splint application should be strongly discouraged. Splint modification to increase thickness or the use of lukewarm water should be used only in conjunction with shortterm cryotherapy to prevent thermal injuries in the acute setting of orthopedic trauma.

## THE IMPACT OF AUTOMATED PROTOCOL IN MANAGEMENT OF DIABETIC KETOACIDOSIS

Adam H. Maghrabi, MD

Marshall University Joan C. Edwards School of Medicine, Section of Endocrinology, Department of Internal Medicine, Huntington, West Virginia.

DKA is characterized by the triad of hyperglycemia, ketonemia and metabolic acidosis. DKA can potentially result in significant morbidity and mortality. DKA hospital admissions and management poses a huge economic burden to health care delivery system. Fluid, insulin and potassium replacement are among the primary important factors in the management of DKA.

Our aim is to determine the effect of implementation of an automated protocol for management of Diabetic Ketoacidosis (DKA).

Our study is a retrospective chart review of DKA patients managed one year before and after the automated DKA protocol implementation at a tertiary care hospital. Patient's medical records and laboratory data base were reviewed.

There were 88 patients managed one year prior (control group) and 70 patients managed one year after the implementation of automated DKA protocol (study group). Total time required for resolution of the DKA was significantly shorter in the study group compared to the control group [11.5 (8.117.1) hours vs. 8.5 (5.812) hours,  $P = 0.0078$ ]. Hypoglycemic events were significantly lower in the study group as compared to the control group [ $P = 0.029$ ]. There was no difference in the potassium abnormalities and rate of decline of glucose. On a 110 scale survey, most of the nurses and doctors found the protocol safe, and effective for prompt communication among them.

Our study showed that implementation of an automated protocol reduced the DKA resolution time and hypoglycemic events without compromising electrolyte imbalance.

## **SAFETY OF INFLIXIMAB IN CHILDREN WITH IBD THE EXPERIENCE OF A SMALL ACADEMIC CENTER IN WEST VIRGINIA**

Northcutt MJ and AlSubu A  
Marshall University SOM

The anti biological drug, Infliximab, was approved for the treatment of IBD in children. Chronic therapy with infliximab is usually needed and may be associated with the development of significant early or delayed side effects.

### **Aim:**

To review the experience of infliximab treatment in IBD children from a small academic center in West Virginia.

A retrospective analysis of all IBD children treated with infliximab (Jan 2006 Sept 2011) in our center was reviewed. The clinical, chronological, and side effects (early and delayed) data were recorded from the patients' charts. The Infusion protocol included pretesting PPD, and administration of low dose of steroid and Benadryl before infliximab infusion. The rate of Infliximab infusion (5mg/Kg) was giving according to a standard protocol.

A total of 30 IBD pts were identified that received 454 infusions. 23 pts had Crhon's Disease (CD) while the rest 7 pts had Ulcerative Colitis ( UC). No. of infusion per pt was averaged at 14.7 for CD and 14.1 for UC. 6 pts had early side effects ( shortness of breath, facial flushing and itching. Only 2 pts had late side effects ( intraabdominal abscess).

In a total of 454 infusions, only 6 (1.3%) children had early side effects. Late side effects were noted in 2 (0.4%) children who required intestinal resection in both cases. The immune compromised state related to infliximab is implicated culprit for this complication.

## **OUTCOMES OF PRIMARY PERCUTANEOUS INTERVENTION OF THE UNPROTECTED LEFT MAIN CORONARY ARTERY STENOSIS IN MYOCARDIAL INFARCTION**

Yousef Darrat

Marshall University

Although coronary artery bypass (CABG) has been the gold standard therapy for left main disease (LMCA) for nearly three decades, some patients do not receive CABG because of high operative risk. Studies suggest that percutaneous coronary intervention (PCI) of the unprotected left main coronary artery (ULMCA) lesion is a feasible alternative offering similar results compared to surgical revascularization.

Our main study aim was to determine 30 day and one year survival in patients who underwent PCI to ULMCA by the presence (AMI) or absence (NonAMI) of acute myocardial infarction. We retrospectively reviewed 64 patients from our regional heart institute who received PCI of ULMCA from years 2000 to 2008.

30 day and one year mortality was higher in patients presenting with AMI, which was associated with cardiogenic shock and LVEF <40% at presentation. Patients that received PCI to either an ostial/mid or distal/bifurcation lesion had significantly lower one year mortality compared to those with PCI involving the entire left main. Patients that received small stents (equal to or less than 3 mm) had higher one year mortality. Stent under sizing was associated with similar survival as that of a proximal small stent but was not significant.

The procedure is a feasible therapeutic option for patients presenting with AMI that have ULMCA although mortality is highest 30 days after intervention. AMI at presentation was associated with cardiogenic shock, LVEF < 40%, and higher mortality. Treatment of an Ostial/Mid or a Distal/Bifurcation ULMCA lesion was associated with a better outcome compared to lesions involving the entire left main. Stent under sizing may be associated with worse outcomes and warrants further study.



**ORAL SESSION IV • 3:15 PM - 4:00 PM**

# **24TH ANNUAL RESEARCH DAY POSTER SESSION**

## **EXAMINING OUTCOMES OF METHADONE AND SUBUTEX CONVERSION IN OPIATEADDICTED WOMEN DURING PREGNANCY**

Christine Gutierrez

Department of Obstetrics & Gynecology, Marshall University Cabell  
Huntington Hospital, Huntington, WV.

The Centers for Disease Control (CDC) reports the use of nonmedical opioid pain relievers to be 4.8% nationally. In West Virginia, it is 5.9% per the CDC. It also found that the number of treatment admissions has nearly quadrupled from 1999 to 2009. Hospitals are exploring the best way to deal with this issue. Methadone maintenance has been thought to be safer for the mother and her infant by preventing the usage of illicit substances. It is also thought it would encourage compliance with prenatal care and improve neonatal outcomes. However, there is contradictory evidence in the literature indicating that it does not prevent additional abuse of illicit substances and does not improve outcomes compared with those not converted to methadone.

The methods of our comparison are via a retrospective chart review from January 1, 2005 to December 31, 2010 for pregnant women women admitted under CPT diagnoses code for opiate abuse. Outcomes examined include gestational age at delivery, NICU length of stay, neonatal abstinence scores, live birth rate, drug screen results, and number of prenatal visits. Additionally, a comparison of the fiscal costs will be explored. Statistical methods will include chisquare analysis.

1048 records were identified under substance abuse among pregnant women at Cabell Hospital during the time period mentioned, 99 of which were specifically opiate abuse. The comparison of outcomes among these records will be presented in further detail.

Substance abuse is a rising problem that needs to be addressed while opioidrelated admissions are on the rise, thus urging the growth for further research on possible treatments and outcomes.

## **ENDOSCOPY SUITE EXPLOSION: A RARE COMPLICATION OF A SCREENING COLONOSCOPY**

Andrea Lauffer

Department of Internal Medicine, Joan C. Edwards School of Medicine,  
Huntington, West Virginia

According to the United States Preventive Services Task Force, screening for colorectal cancer via colonoscopy should commence at the age of fifty and conclude at the age of seventyfive for men and women. However, a rare complication that could potentially increase morbidity and mortality in patients undergoing screening colonoscopies is seldom explained to patients because it seldom occurs. This complication is known as a colonic explosion.

We report a case of a fifty year old female with an extensive past medical history who underwent a routine screening colonoscopy. At the onset of the procedure, optimal bowel preparation was noted by the endoscopist. After the removal of a colonic polyp, hot cauterization was attempted to complete the excision. Consequently, the patient had an unexpected colonic explosion requiring an emergent right hemicolectomy and postoperative care in the surgical intensive care unit.

Only twenty cases of colonic explosion have been reported in the literature from 1956 to 2006. Antiquated methods of bowel preparation were found to produce gases that increased the chance of a colonic explosion, usually after the application of hot cautery in removing polyps. After the implication of polyethylene glycol electrolyte lavage solution, it has been discovered that this particular bowel preparation significantly lowers the hydrogen and methane concentration, thus reducing the chances of a colonic explosion. Despite the reduction in risk using the polyethylene glycol electrolyte lavage solution, colonic explosions have still occurred, and the reason is often unclear. Therefore, this case illustrates the dangerously unique occurrence of a routine screening colonoscopy complication, the need of the physician and patient to be aware of this rare complication, and the necessity to ensure and execute appropriate bowel preparation.

## CAMPYLOBACTER AS AN UNUSUAL CAUSE OF DIFFUSE GASTROINTESTINAL ULCERS

Mohamed Alsharedi

Joan C. Edwards School of Medicine

**Introduction:** Campylobacter enteritis is an important cause of acute diarrhea worldwide. The typical symptoms of abrupt abdominal pain and diarrhea are familiar and usually easily recognized. However, complicated cases may present with unusual clinical manifestations mimicking other diseases, such as colitis and lymphoma. We report a case of uncommon presentation of Campylobacter infection.

**Case presentation:** A 59 year old female schoolteacher is admitted to the hospital with one month history of progressive fatigue, nausea and vomiting. Her symptoms worsen with epigastric pain, inability to eat and diarrhea, she failed outpatient treatment with omeprazole and ondansetron, she was found orthostatic on exam. Initial workup revealed small bowel thickening on her abdominal CT scan and gallbladder wall thickening, sludge and small stones on ultrasound study. With further workup, esophagogastroduodenoscopy showed erosive gastritis in the antrum and duodenitis in the duodenal bulb, second and third portion of the duodenum. Biopsy samples show villous blunting with focal acute inflammation without exudates formation, with no evidence of chronic inflammation, atypical lymphocytes or granulomatous inflammation and a negative PAS stain. Results of small bowel followthrough are consistent with infectious or inflammatory etiology. Evaluation for Zollinger Ellison syndrome was unremarkable. Stool studies demonstrate Campylobacter gastroenteritis. Patient started on a fiveday course of macrolides, showing good improvement of her symptoms. Follow up esophagogastroduodenoscopy performed 9 days post admission were consistent with markedly improved antral erosion and complete healing of the ulcerative duodenitis.

**Conclusion:**

This case highlights the challenge of clinical diagnosis in a complicated case of Campylobacter. In addition, while endoscopy provides a valuable assessment of disease severity, definitive diagnosis of Campylobacter enteritis is established by stool culture or rapid enzyme immunoassay (EIA). Uncommon Campylobacter infections can result in severe disease with positive treatment outcome once diagnosed accurately.

## **OBSTETRICAL EMERGENCY SIMULATOR CURRICULUM**

Amanda Pauley and Sarah Price

MUSOM Dept of ObGyn

The infrequent and high –stakes nature of obstetric emergencies requires physicians to respond quickly and proficiently to a complex and highstress situation, a situation they have likely had little opportunity to experience. We plan to create a realistic simulation to prepare physicians at our institution to manage these situations. Shoulder dystocia, breech extraction, operative deliveries with forceps, maternal hemorrhage, and umbilical cord prolapse can all be obstetrical emergencies that require immediate recognition and a wellcoordinated response. Simulation education provides an opportunity to learn and master simple as well as complex technical skills needed in emergent situations. This simulation training will have an enormous impact on human performance and improve safety for both the mother and infant.

## **AN INTEGRATED CASEBASED LEARNING MODEL TO ENHANCE TEACHING AND LEARNING**

Penny G Kroll  
Marshall University

A series of cases were developed to be utilized in faculty facilitated Clinical Application Seminar and Experiences (CASE) courses as a curricular strategy to help students discover, reinforcement and integration didactic material presented Year 1 of the Doctor of Physical Therapy program. This strategy is expected to help student develop and reinforce the problem solving, clinical decisionmaking, legal and psychosocial knowledge, skill, attitudes and behavior necessary to meet a number of our program objectives and accreditation criteria.

Eleven area clinicians attending a case develop workshop, reviewed didactic course objectives then developed case scenarios to support these objectives. Accreditation criteria included with each objective, allowed mapping of those criteria being met by each case.

The clinicians developed:

- a case scenario
- stimulus questions to be completed by students prior to the case session.
- mock patient data to provide to be utilized by students and faculty facilitators, including: interview, examination and evaluation results; differential diagnosis; assessment, PT and patient problem lists, goals; treatment interventions; home programs, followup/reevaluation data and outcomes.

After workshop completion, the cases were posted on Google Docs for 6 weeks so both clinical and academic faculty could continue to work on the cases to completion. After the cases are deemed “complete”, they will be beta tested” on the other groups, and final changes incorporated into the various case scenarios.

Appropriate changes will be made after beta testing, and cases will be utilized in CASE courses during the 20122013 academic year. A survey to be developed and administered to students prior to and after participating in each semester of cases to assess the perceived effectiveness of this case methodology in achieving/supporting stated objectives. Changes in case design and administration will be made as necessary depending on feedback.

**MULTIDISCIPLINARY PERCEPTIONS OF THE EFFICACY OF PHYSICIAN TO PHYSICIAN TRANSITION OF CARE: CURRENT PRACTICE AND CHANGES IN PERCEPTIONS POST POLICY INTERVENTION.**

Dana Eilen

Marshall University

One salient issue with critically important patientcare consequences concerns the transfer of care of hospitalized patients from one physician to another during shift changes. Surprisingly, there is a scarcity of data on the issue of communication during handoffs in the medical education literature. We will conduct an anonymous survey of the cardiology fellows, attendings, and nurses throughout our teaching system. The survey will be designed to obtain a view of the system from each of their unique vantage points. We will use the Surveymonkey system. We will then analyze the data and use this as our baseline.

There was agreement between the fellows, faculty, and nurses that the night time covering fellows use information gained from the nurses or the chart to make medical decision while on call. No fellow said they use information obtained from other fellows during sign out. 88% of the fellows said that “very often” or “frequently” a nurses call is the first time they are introduced to a patient our service is covering and that they feel underprepared to care for that patient while on call due to lack of information. Also, 88% of fellows have either noticed others committing medical errors due to lack of information they should have received at sign out, or committed one themselves. All faculty have noticed medical errors for the same reasons occasionally or rarely. These trends are noticed by the nurses and reflected in their responses. Most of the nurses feel that the communication between covering cardiology fellows is “fair” or “poor”. Communication between covering cardiology fellows needs significant improvement. We will initiate our previously planned structured, online, comprehensive, and mandatory sign out system. In 6 months we will reissue this survey to see if we have had any improvement in the subjective efficacy of our communication.

## **RESIDENT RESEARCH CURRICULUM, MULTIPLE APPROACH FOR RESIDENT RESEARCH EDUCATION.**

Wesam Bolkhair

Department of Internal Medicine, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV

According to the Accreditation Council for Graduate Medical Education (ACGME), graduate medical education must take place in an environment of inquiry and scholarship in which residents participate in the development of new knowledge, learn to evaluate research findings, and develop habits of inquiry. We hear describe a research curriculum to assist our residents to participate in scholarly activity.

This is a twenty seven month duration curriculum, new resident will be involved after first three months of starting residency and have to complete their research project six months before graduation. We designed our curriculum to include online didactic, involvement with a mentor, progress monitoring, small group discussion, protected time for research, opportunity for presentation and publication, and final grading for the research project. Data were collected by learner survey and will be statistically analyzed. Our initial results from post didactic survey about learner understanding of the research process IRB approval, abstract/manuscript writing, research methodology/design and presentation skills will follow

### Discussion.

The potential benefits of residents' research are numerous. Residents' research may lead to better clinical care, clinical reasoning, lifelong learning, increase intellectual curiosity and critical thinking. residents' research may also help reverse the trend of decreasing numbers of clinician investigators. Furthermore, Presentation and publication may improve personal academic achievements and increase the recognition of residency programs. To achieve such goals, an educational environment of planned research educational experience should be designed, to meet clear goals and objectives, utilize multiple methods and approaches, and involves continues assessment and evaluation mechanisms

### Conclusion,

Resident research is beneficial and important, research curriculum is essential for promoting research activity by residents, which should reflect clear goals, objectives, methods, assessment and evaluation mechanisms



**POSTER PRESENTATIONS • SESSION I • 9:45 AM – 10:30 AM**

# **24TH ANNUAL RESEARCH DAY POSTER SESSION**

**BENZYL ISOTHIOCYANATE TARGETS CHEMORESISTANT AND METASTATIC HEAD AND NECK SQUAMOUS CELL CARCINOMA CELLS**

M. Allison Wolf

McKown Translational Genomic Research Institute, Joan C. Edwards School of Medicine, Huntington, WV.

Approximately 500,000 cases of head and neck squamous cell carcinoma (HNSCC) are reported worldwide each year. Despite recent improvements in cancer treatment, the increase in overall survival of advanced HNSCC has not improved in the past 3 decades. Consequently, the need for new therapeutic options to enhance survival of patients with advanced HNSCC is needed. Benzyl isothiocyanate (BITC), a natural compound found in cruciferous vegetables, is showing promising results in targeting chemoresistant and metastatic HNSCC cell lines.

Our data suggests BITC enhanced cell death and decreased cell viability of HN30 and HN12 to cisplatin after 24, 48 and 72 hours. A migration assay indicated that the HN12 and HN30 are inhibited by BITC in a dose dependent manner. Additionally, 10 $\mu$ M BITC inhibited migration of the highly metastatic HN12 cell line, and when combined with 10 $\mu$ M cisplatin this effect appeared to be enhanced. Treatment with cisplatin alone resulted in migration rates similar to the vehicle control.

The present results suggest that BITC may be able to chemosensitize HNSCC cancer cells to cisplatin. BITC also appears to reduce migration of HNSCC cells. Consequently, our current data suggests that BITC may be a novel adjuvant therapy for patients with aggressive HNSCC.

## **CHMP1 PROTEIN REGULATES WING VEIN DEVELOPMENT IN DROSOPHILA**

Meagan Valentine  
Marshall University

Chmp1A is a component of the ESCRTIII complex, a protein complex required for the recycling and degradation of activated membrane receptor proteins. Chmp1A is conserved and in vertebrates, has been shown to behave as a tumor suppressor. Additionally, Chmp1A has been linked to pancreatic cancer in humans, as pancreatic tumors have lower Chmp1A expression than normal pancreatic cells. Pancreatic cancer is a leading cause of cancer death, with a 5% five year survival rate. Despite the severity of this disease, little is known about its molecular pathogenesis. In order to better understand the role Chmp1A in the cell, we are using *Drosophila* as a model to study Chmp1A function. There is a single Chmp1 protein in *Drosophila* that is homologous to Chmp1A in humans. No studies have been published on Chmp1 in *Drosophila*.

Our knockdown and overexpression studies in the *Drosophila* wing have shown genetically that Chmp1 may regulate the Epidermal Growth Factor (EGF) pathway and NotchDelta signaling. Chmp1 knockdown and overexpression result in oversized wing veins and widening of the distal tip of wing veins, respectively. These phenotypes could be resultant of altered EGF or NotchDelta signaling. We are using genetic and molecular techniques, such as immunohistochemistry and western blot, to further determine if Chmp1 regulates EGF or NotchDelta signaling. It is likely Chmp1 regulates both of these pathways, as both are regulated by ESCRT machinery.

Using a tagged Chmp1 protein, we are also investigating the localization of Chmp1 in the *Drosophila* larval wing disc. Chmp1 seems to localize in patches and apically in the cell. Assuming Chmp1 function is conserved, we expect localization to endosomes and condensed chromatin, as it does in vertebrates. To date, we have not observed colocalization of Chmp1 with endosomal markers. This could indicate a difference in *Drosophila* Chmp1 and vertebrate Chmp1A function.

## **DISCRETE SENSORY ENCODING OF FORCE INCREASES OR DECREASES IN THE STICK INSECT LEG**

Sumaiya Chaudhry

Dept. Anat. & Pathol., J.C. Edwards Sch. Med., HUNTINGTON, WV;  
Dept. of Animal Physiology, Zoological Inst., Univ. of Cologne, Cologne,  
Germany; Dept. of Biol. Cybernetics, Univ. of Bielefeld, Bielefeld, Germany

The control of walking is remarkably similar in all legged animals. Many of the mechanisms used to regulate forces in walking are solutions to common biomechanical problems: legs must generate appropriate forces for support and propulsion in stance and a leg must not be lifted in swing until it is unloaded.

We have studied how loads and muscle forces are detected in the legs of stick insects (*Carausius morosus*) by campaniform sensilla, receptors that detect forces as strains in the exoskeleton. Forces are applied to the exoskeleton or to muscle insertions and sensory activity is recorded from the main nerve of the middle leg.

We have identified a group (Group 6) of campaniform sensilla on the tibial segment of the leg that is organized in two spatially separated groups with diverse morphology (Group 6A is proximal with oval cuticular caps, Group 6B is distal and has round caps). Despite the differences in cap structure, responses of the subgroups are strictly directional: Group 6B sensilla respond to force increases toward joint extension while Group 6A receptors discharge when those forces decrease. Forces applied toward joint flexion produce the reverse pattern of discharge. All receptors accurately encode the rate of change of force increments and decrements. Bending forces applied outside of the plane of joint movement elicit discharges at lower frequencies in which sensitivity to vectorial direction is preserved. In addition, the tibial sensilla show selective responses to resisted contractions of the tibial muscles. Stimulation of caps of individual receptors produces excitatory (Group 6B) or inhibitory (6A) reflexes in tibial extensor and trochanteral depressor motor neurons consistent with their directional sensitivities.

These findings suggest that the detection of force increases and decreases is a common element in the control of insect walking, as is requisite in all legged animals.

## **EFFECT OF DIMETHYL SULFOXIDE ON BONE HEMOSTASIS WITH OBESITY**

Omar Akhtar

Department of Internal Medicine, Joan C. Edwards School of Medicine, 2 Center for Diagnostic Nanosystems, Marshall University, 3 Huntington VAMC, 4 Cabell Huntington Hospital, Huntington, WV. \* correspondence: wum@marshall.edu.

Obesity is characterized by elevated state of inflammation which has been shown to negatively regulate bone quality. The objective of this study was to evaluate the effect of antiinflammatory agent on bone hemostasis in obese Zucker rat model.

Twelve 4week old obese Zucker rats were randomly assigned to control or dimethyl sulfoxide (DMSO)treated groups (N = 6). DMSO (0.09 g / kg body weight / day) was given via drinking water for 6 months. Lean Zucker rats (N = 6) were used to control for the effects of obesity. At 30 weeks of age animals were euthanized and the femur and tibia of both hind limbs were dissected. Bone mineral density (BMD) was measured using a GE Lunar iDXA densitometer equipped with a specific animal software enCORE™ 2011. Serum was collected for the determination of the osteoblastic marker osteocalcin and bone degradation marker pyridinoline crosslinks (PYD) via ELISA.

Compared to the obese control animals, DMSO treatment increased the BMD of both femur and tibia by 26.8% and 23.7%, respectively (p = 0.05). BMD density in the obese treated animals was not different from that observed in the lean Zucker control animals. Serum PYD in obese Zucker control was significantly higher than that of lean Zucker animals (+149.7%; p = 0.05). Interestingly, chronic DMSO ingestion reduced circulating PYD in obese animals to a level equivalent to that of lean control animals (p = 0.1). Serum osteocalcin was not statistically different between three groups.

DMSO is a widely used polar aprotic solvent with clinically proven antiinflammatory activity. Chronic DMSO ingestion was able to increase BMD in both tibia and femur of obese Zucker rats and decrease circulating PYD levels, supporting a beneficial effect of antiinflammatory agents on bone health with obesity.

## **FINDING A BRIDGE THAT CONNECTS THE P53 AND PRB TUMOR SUPPRESSOR PATHWAYS**

Miranda Carper

McKown Translational Genomic Research Institute, Joan C. Edwards School of Medicine, Huntington, WV

The tumor suppressors p53 and pRb both regulate cell cycle, DNA repair, apoptosis, differentiation, and senescence. Both tumor suppressor genes are found inactivated in a variety of malignancies, including osteosarcoma. Patients who have mutations and/or inactivations in both p53 and pRb have increased tumor recurrence and metastasis. Evidence suggests p53 and pRb cooperate to inhibit cancer progression and that communication exists between the p53 and pRb pathways, however, the complete mechanism is unknown. We hypothesize that p53 and pRb crossregulate downstream effector proteins responsible for initiating anticancer processes. The focus of the present study is to investigate the crosstalk between p53 and pRb and determine a downstream effector protein for further analysis.

Microarray analysis was conducted on normal lung fibroblast cells (WI38) following p53, pRb, or both p53 and pRb overexpression. Five genes (RGS16, BTG2, STAT4, IL6, and BIM) were chosen to verify the microarray results using realtime PCR (qPCR) and Immunoblot analysis in WI38 and Saos2 cells (which contain nonfunctional p53 and pRb). IPA (Ingenuity Pathway Analysis) was used to analyze the microarray data and pinpoint target proteins for further analysis.

Analysis of the microarray data showed, 294p53, 650Rb, and 514p53/pRb differentially expressed genes compared to the controls. We narrowed our focus to 39 genes commonly regulated by p53 and pRb, and 140 genes differentially expressed only when p53 and pRb are overexpressed. The results of the qPCR analysis support the microarray data. Regulation of RGS16 (downstream effector) by p53 and pRb was further investigated due to its ability to decrease signaling of oncogenic pathways responsible for metastasis, invasion, and chemoresistance.

Our results demonstrate that both p53 and pRb regulate RGS16. However, further analysis will have to be conducted to determine the function and therapeutic benefits of RGS16 in the p53 and pRb crosstalk pathway.

**INTRATRACHEAL INSTILLATION OF THE CERIUM OXIDE NANOPARTICLES MAY INDUCE CARDIAC ALTERATIONS IN THE MALE SPRAGUEDAWLEY RATS.**

Ashu Dhanjal

Joan C. Edwards School of Medicine, Marshall University

Cerium Oxide (CeO<sub>2</sub>) nanoparticles are commonly used in the manufacturing industry and are thought to exhibit potent antioxidant activity. This study was done to address the effect of CeO<sub>2</sub> nanoparticles on the cardiac structure and function.

7week old male Sprague Dawley rats (n=24) were randomized to one of two groups: CeO<sub>2</sub> nanoparticle (20 nm diameter) instillation or age-matched saline control. Animals were subjected to two dimensional echocardiography before being sacrificed at 56 and 90 days (n=6/group) post exposure.

CeO<sub>2</sub> nanoparticle exposure was associated with increased LV posterior wall thickness during diastole at 56 and 90days post exposure (56 days  $0.21 \pm 0.03$  cm vs.  $0.14 \pm 0.02$  cm;  $P < 0.05$  and for 90 days:  $0.27 \pm 0.01$  cm vs.  $0.17 \pm 0.01$  cm;  $P < 0.05$ ) and elevations in MV A Max velocity at 90 days post exposure ( $45 \pm 2$  vs.  $64 \pm 4$  cm/s;  $P < 0.05$ ). Also CeO<sub>2</sub> nanoparticle exposure was associated with reduced LV internal dimension during diastole (90 day control:  $0.82 \pm 0.02$  cm vs. 90 day exposure:  $0.76 \pm 0.03$  cm;  $P < 0.05$ ), RV dimension during diastole (90 day control:  $0.21 \pm 0.02$  cm vs. 90 day exposure:  $0.14 \pm 0.00$  cm;  $P < 0.05$ ), end diastolic volume (90 day control:  $1.17 \pm 0.07$  ml vs. 90 day exposure:  $0.88 \pm 0.03$  ml;  $P < 0.05$ ), and end systolic volume at both 56 and 90 days post exposure (56 day control:  $0.21 \pm 0.03$  ml vs. 56 day exposure  $0.14 \pm 0.02$  ml;  $P < 0.05$  and 90 day control:  $0.27 \pm 0.01$  ml vs. 90 day exposure:  $0.17 \pm 0.01$  ml;  $P < 0.05$ ). We found significant variations in the structure of the exposed hearts which may suggest systolic as well as diastolic dysfunction but further studies are warranted.

## A RARE CASE OF CUSHINGS IN PREGNANCY

Vishnu Garla  
MUSOM

To report a rare case of Cushing syndrome in pregnancy and to elucidate the diagnostic and management dilemmas associated with it.

A 31 year old 16 weeks pregnant woman with history of gestational diabetes and hypertension was admitted with symptoms of headaches, blurred vision along with excessive weight gain and hirsutism. Physical examination revealed facial plethora, prominent supraclavicular fat pads, wide purple abdominal striae and multiple bruises in the lower extremities. Review of her medical records revealed a left sided adrenal mass of 2.7 cm found 6 months ago with inconclusive and incomplete endocrine work up. Further laboratory data revealed serum cortisol 24.5 mcg/dl (317), 24 hour urine free cortisol 1845 mcg/24hours (050) and 24 hour urinary protein 585 mg (075), ACTH <1.1 pg/ml (763). She has normal levels of renin, aldosterone, DHEA and urinary metanephrines. Serum cortisol did not suppress (24 mcg/dl) after overnight 1mg of dexamethasone. MRI revealed that left adrenal mass has enlarged and now measures 3.2 cm with signal dropout on out of phase imaging suggestive of a lipid laden adrenal adenoma. She was diagnosed with Cushing syndrome due to left adrenal adenoma and left adrenalectomy was done. Histopathology specimen confirmed the diagnosis without any evidence of malignancy. Patient was started on physiologic dose of steroids. Her requirements for antihypertensive medications and insulin drastically reduced and proteinuria improved after the surgery. Plasma ACTH level rose up to normal after 4 months. Patient received stress dose steroids during an uncomplicated delivery of a healthy male baby after 37 weeks of gestation. Steroids were slowly tapered off after the delivery.

Pathologic Cushing syndrome in pregnancy is very rare and poses a diagnostic dilemma to the physician due to the physiologic hyper secretion of cortisol during normal pregnancy.

## A CASE OF AN ACTHPRODUCING PHEOCHROMOCYTOMA

Marc Hettlinger

Department of Internal Medicine, Joan C. Edwards School of Medicine,  
Huntington, WV

Pheochromocytomas are rare neuroendocrine tumors, which produce excess catecholamines. Extremely rare is the possibility of excess ACTH production from a pheochromocytoma, leading to a state of excess cortisol and Cushing's syndrome.

A 64year old female was referred to the Marshall University Endocrinology clinic by her PCP for evaluation of uncontrolled hypertension and possible Cushing's Syndrome. She also had a 3year history of a 1.5cm left adrenal nodule, that had been noted to be stable on serial CT scans.

Excess cortisol production was confirmed with elevated 24hr urine cortisol levels and an abnormal low dose dexamethasone suppression test. Ectopic ACTH production was suspected with elevated ACTH levels, a high dose dexamethasone suppression test with weak cortisol suppression and a negative MRI of the brain.

The patient also had clinical features of pheochromocytoma including hypertension, sweating and palpitations. Catecholamine excess was confirmed with blood and urine testing, and an MRI of the abdomen was consistent with pheochromocytoma.

The patient underwent surgical removal of her adrenal mass with subsequent resolution of her symptoms and normalization of her blood sugar, electrolytes and cortisol levels.

Excess cortisol can be secondary to Cushing's disease in which there is ACTH hypersecretion by the pituitary, an adrenal tumor, or from ectopic ACTH production (such as from small cell lung cancer and other tumors). Pheochromocytomas may also rarely be associated with ectopic ACTH production leading to a state of excess cortisol in addition to the effects of excessive catecholamines.

The clinical presentation of pheochromocytomas can vary greatly, and in ACTHproducing pheochromocytomas most patients suffer from severe Cushing's syndrome with hypokalemia and diabetes mellitus. If diagnosis and treatment is delayed, this condition has a high mortality and morbidity. Treatment is surgical removal after appropriate medical therapy.

## A CASE OF ANAPLASMOSIS IN SOUTHERN OHIO

Youhana Greges

Marshall University Joan C. Edwards School of Medicine

Human granulocytic anaplasmosis (HGA) is a tickborne illness characterized by fever, malaise, thrombocytopenia, and leukopenia. It was formally called Human Granulocytic Erlichiosis (HGE). Approximately 600800 cases are reported in the US per year, with the highest incidence in Minnesota, Wisconsin, New York, New Jersey, and Connecticut. A 53 yearold male dairy farmer from Southern Ohio presented with a two week history of high grade fevers, somnolence, headache and photophobia. He had no history of recent travel, camping, or hunting. A few weeks prior to admission, he noted several mosquito bites and had removed numerous ticks from his body. Physical exam did not reveal any rashes or meningismus. Upon admission, his white blood cell count was 2.9, platelets were 55, AST was 180 and ALT was 150. Alkaline phosphatase was within normal limits. Hepatitis panel was negative. A chest xray was negative. Urine analysis and culture were negative as well. CSF analysis was remarkable for a WBC count of 10 with 88% lymphocytes and normal CFS glucose and protein. CSF bacterial and fungal cultures were negative. He was empirically started on doxycycline pending viral and bacterial studies which later returned negative. He defervesced and his blood counts improved on therapy. Serology came back with an elevated IgG titer of 1:128 for *Anaplasma phagocytophilum*. This case showed typical features of the tick borne illness and laboratory findings including elevated transaminases, thrombocytopenia, and leukopenia. Treatment with Doxycycline gives favorable outcome with early diagnosis and treatment. HGA is a rare but reportable disease with potential for serious complications.

## A CASE OF CONFUSION

Arun Manoharan  
Marshall University

Hypercalcemia can be seen in malignancy which can be a paraneoplastic syndrome. This has been associated with PTHrp. This is a case of hypercalcemia from possible Renal Cell Carcinoma.

A 64 year old male who has a PMH of DM,HTN,CAD, CABG comes to the ER with increasing confusion. Patient's family noticed that he was not coherent for 3 days which got worse and brought to the ER. Patient did not have any fever, cough, SOA, neck stiffness, hematuria. Patient was found to have a left renal mass on a CT after a fall 1 month before this admission. Exsmoker. Physical exam showed BP 146/99, HR89, RR 20, Temp 98, AAOX3 Pupils Reactive.Lungs clear, ABD: s,NT,no masses, no organomegaly CNS: CN intact, motor 5/5, sensation intact, DTR brisk. Labs Hgb12.0 wbc7.3,plt423:na137 K 4.5 CL 101 Bicarb 28.9 BUN 14 Cr 1.0 Glu 97 Ca 13.5 Alb 2.9. intact PTH <7. Vit 25 D 22.1, vit 1,25 d 17.1, tsh 1.24 PO4 3.3. CT head no acute abnormalities. EKG no acute changes. MRI abdomen enhancing mass inferior pole L kidney. US kidney large solid mass L kidney.Patient was on IV hydration at 125ml/hr and given IV Lasix.CT chest showed multiple non calcified nodules, filling defect R middle and lower lobe. CT Spine lytic lesions of T4 and L2 and LN in medistinal, retrocrural, and mesentery. Patient had a dose of pamidronate. Patient's calcium did improve to baseline and his mental status improved. Renal Mass workup still pending.

Hypercalcemia can be seen in 30% of malignancy. The malignancy releases PTHrp or could be from IL 6, IL 1, or prostaglandins. It is important to find the cause of the ypercalcemia and to treat accordingly. Patient should be adequately rehydrated with IV fluids and other measures including lasix, bisphosphonates are second line treatments.

## **A MASS IN THE ASCENDING AORTA, IN A 40 YEAR OLD PATIENT WITH HISTORY OF RECURRENT THROMBOEMBOLISM**

Getachew Zeleke

Department of Internal Medicine and Department of Cardiology, Marshall University School of Medicine; St Mary's Medical Center

Ascending aorta thrombosis is a potentially lethal condition, very rarely seen in younger patients, and when it is found, it warrants urgent evaluation and prompt action.

A 40 year old Caucasian, male, nonsmoker patient with past medical history of MI at age 28, bilateral upper extremity DVTs, and history of Intracerebral hemorrhage, was admitted to a University hospital after he presented with confusion, headache and seizure. MR Venography demonstrated extensive Cerebral sinus thrombosis. TEE revealed mass in the ascending aorta (tumor Vs thrombus), which was also seen with CTA and MRI of the chest. The patient underwent open heart surgery. A 7cm X 1.6 cm X 1 cm mass was found in the ascending aorta, attached to Noncoronary cusp of the aortic valve, and it was resected. Frozen section of the mass suggested that it could be a thrombus, which later was confirmed by histopathology. Extensive workups for hereditary and acquired Thrombophilias including, Factor V Leiden, Protein C & S deficiency, antiphospholipid antibody syndromes, Prothrombin gene mutation, Antithrombin III deficiency and homocystinemia were negative. The patient was put on long term anticoagulation, had smooth post operative course, and discharged home on the 7th post operative day.

Aortic thrombosis may be seen in elderly patients with previous aortic pathologies, including an atherosclerotic plaque, aortic aneurysm or dissection. When a young patients with history of recurrent thromboembolism present with focal neurologic deficits, TEE/ CT angiography have a greater role in identifying the source. Ascending aorta thrombosis in a young patient necessitates thrombophilia evaluation; however, the underlying cause may remain obscure even after extensive workup. As this condition puts the patient at increased risk of recurrent embolism, it is preferably managed surgically, and then patients are put on lifelong anticoagulation therapy.

## **ADRENAL VENOUS SAMPLING: AN UNUSUAL METHOD FOR INVESTIGATING BILATERAL ADRENAL MASSES**

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Subclinical Cushing syndrome (SCCS) is the most frequent hormonal abnormality in adrenal incidentaloma. Bilateral adrenal masses account for 10 to 15 % of adrenal incidentalomas. We are presenting a case of bilateral adrenal masses with SCCS secondary to ACTH-independent Macronodular Adrenal Hyperplasia (AIMAH). We are also describing Adrenal venous sampling (AVS), a new emerging technique, which helps identify the source of cortisol secretion in this setting.

51 year old lady was evaluated for bilateral adrenal masses found incidentally on an abdominal MRI. Lab work showed lack of suppression of cortisol in response to both low and high dose dexamethasone with undetectable base line ACTH, normal 24 hour urine free cortisol and normal mid night salivary cortisol, suggestive of SCCS. AVS was performed and blood cortisol and epinephrine levels were obtained from both adrenal veins (AV) and peripheral vein (PV). Robotic left adrenalectomy was performed since the left adrenal mass was larger. Pathology favored the diagnosis of AIMAH. Patient was eventually deemed cured.

Findings on MRI and CT were not typical of adrenal hyperplasia or bilateral adenomas. The dilemma was: which gland is hypersecreting cortisol. Adequate catheterization of the AV is ensured if the epinephrine level difference between AV and PV is more than 100. An AV: PV cortisol ratio of  $>4.1$  may mean autonomous cortisol secretion,  $>6.5$  points towards an adrenal adenoma, and between 4.1 and 6.5 (as seen in our case) may indicate hyperplasia. The overall picture suggested AIMAH as the cause of the SCCS, which is very rare.

### Conclusion:

AVS can be a useful tool to localize the source of the cortisol hypersecretion in ACTH-independent Cushing syndrome with bilateral adrenal masses. Furthermore, AVS can also help distinguish bilateral adrenal adenomas from AIMAH if the radiological findings are not clear.

## **ADVANCED ENDOMETRIAL ADENOCARCINOMA IN A 32 YEAROLD NULLIPAROUS WOMAN**

Heidi Michael

Joan C Edwards School of Medicine

Although uncommon, up to 14% of endometrial adenocarcinoma cases occur in women less than 40 years of age. The presenting symptom almost always includes abnormal uterine bleeding. AUB is common in premenopausal women with multiple causes that can be difficult to manage. Due to the varied causes and possibility of concurrent causes, a standardized strategy for evaluation of AUB has not yet been developed.

32 yearold nulliparous women presented with chronic pelvic pain and a 4 year history of AUB. Multiple transvaginal ultrasounds consistently showed multiple fibroids with degenerative characteristics. The patient was unable to tolerate OCP therapy and fertility conserving surgeries had been unable to determine a cause or cure of her AUB. When she transferred care to our facility she presented with continued pelvic pain, heavy bleeding, fatigue, and had just received a blood transfusion for a hemoglobin of 6. The patient did not desire to have children and so it was decided that she should have a hysterectomy. She underwent a robotic total laproscopic assisted hysterectomy and pathology revealed a FIGO grade 3 endometrioid adenocarcinoma.

Abnormal uterine bleeding is a common complaint in premenopausal women, however the evaluation and treatment is unique to each case. Although an uncommon cause, endometrial adenocarcinoma should be considered if a patient has certain risk factors, sonographic findings, and/or has failed other treatments.

## **ATRIOBRONCHIAL FISTULA: RARE COMPLICATION OF ATRIAL FIBRILLATION ABLATION**

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In our aging population, atrial fibrillation is becoming more prevalent. Ablation has allowed patients whose atrial fibrillation is refractory to medication, to receive permanent relief from their symptoms. The combined complication rate of the various ablation techniques is small, about 4.5%. These can be serious, and include: tamponade (1.3%), CVA (0.23%), death (0.15%), pneumothorax (0.09%), atriopharyngeal fistula (0.04%), hemothorax (0.02%), and atriobronchial fistula (incidence unknown). We present a case that illustrates the importance of maintaining a high clinical suspicion of procedure complication when a patient presents characteristic cluster of symptoms and signs after atrial fibrillation ablation.

We are presenting a case of atriobronchial fistula, a rare complication of treatment of atrial fibrillation with catheter ablation. The patient was 71 old male who presented to the emergency room of our regional heart center with complaints of altered mental status and seizures. He had history of atrial fibrillation treated with catheter ablation two weeks back.

CTA head was done at the time of presentation which showed small vessel occlusive disease. Also multifocal areas of gas bubbles were seen in right cerebral hemisphere involving all the three cerebral artery territories with air fluid level in right internal jugular vein.

Patient was diagnosed as having CVA with possible septic emboli to brain and endocarditis was included in the differential diagnosis. A transesophageal echocardiogram was done which showed spontaneous bubbles in right superior pulmonary vein entering into the left atrial appendage and ascending aorta, highly suspicious of atriobronchial fistula. The patient subsequently developed bradycardia, PEA and was coded but could not be resuscitated and died.

Atrio bronchial fistula is a very rare but devastating complication after catheter ablation of atrial fibrillation. Because of its high mortality rate it should be suspected with high priority in any patient who presents with hemoptysis and/or stroke after atrial fibrillation ablation.

## **BLOODY...!, HEMATURIA SECONDARY TO ALPHA 2ANTIPLASMIN DEFICIENCY.**

Joaquin Llado

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Alpha 2Antiplasmin deficiency is an uncommon but significant source of recurrent bleeding. Patients lack the major inhibitor of plasmin, thereby allowing plasmin unchecked fibrinolysis. Patients will most likely present with intact initial clotting, as platelets and coagulation cascade are unaffected, followed by delayed bleeding. We report a case of Alpha 2Antiplasmin and discuss the management of this uncommon congenital coagulopathy.

A 37 year old male presents with recurrent hematuria for 5 weeks, with the passage of blood clots and dark urine associated with right flank pain. Patient denied any urinary frequency, urgency, fever, or chills.

Patient has a history of recurrent nephrolithiasis and Alpha 2Antiplasmin deficiency. Patient had stopped taking his aminocaproic acid 5weeks prior. There were no significant findings on physical exam except for right flank pain and right lower quadrant tenderness. Urinalysis showed loaded red blood cells, no evidence of urinary tract infection on urine culture. Initial blood test showed normal hemoglobin, platelets, liver function tests, prothrombin time and activated partial thromboplastin time. CT scan of his abdomen and pelvis showed a small 1mm stone in the intrarenal area.

Patient's symptoms were successfully treated with serial transfusions of fresh frozen plasma and restarting him back on aminocaproic acid. Diagnosis can be difficult for Alpha 2Antiplasmin deficiency due to intact initial bleeding control followed by delayed bleeding. Practitioners must consider this diagnosis as well as secondary causes of coagulopathy. Diagnosis is made after ruling out secondary causes, with a serum Alpha 2Antiplasmin level. Management for acute bleeding is achieved with transfusions of fresh frozen plasma and oral fibrinolysis inhibitors. Patient has a history of recurrent nephrolithiasis and Alpha 2Antiplasmin deficiency. Patient had stopped taking his aminocaproic acid 5weeks prior. There were no significant findings on physical exam except for right flank pain and right lower quadrant tenderness. Urinalysis showed loaded red blood cells, no evidence of urinary tract infection on urine culture. Initial blood test showed normal hemoglobin, platelets, liver function tests, prothrombin time and activated partial thromboplastin time. CT scan of his abdomen and pelvis showed a small 1mm stone in the intrarenal area.

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**CANDIDA MENINGITIS IN A YOUNG MAN WITH HISTORY OF DIABETES MELLITUS AND INTRAVENOUS DRUG ABUSE**

Kevin Johnson

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Candida species have been known to cause meningitis in the immunosuppressed and the neonatal population, but its association with diabetics and intravenous (IV) drug users is not well documented. Candida proves once again as in our case to be an opportunistic organism that can appear anywhere and at anytime.

This case presents a 20 year old male IV drug user with PMH of diabetes, who came in for worsening headaches and weakness for 3 weeks. Initial workup was performed with an unclear etiology. The patient was sent home after slight improvement. A month later, he presented with worsening headaches, memory loss, and gait abnormalities. A second work up revealed Candida albicans on CSF cultures and treatment was initiated. The patient failed treatment with fluconazole and recovered by changing to Amphotericin B and flucytosine treatment.

Candida meningitis can be fatal; Amphotericin and flucytosine successfully cured it, but this case underscores the importance of clinical suspicion in absence of positive cultures. The treatment of Candida is normally successful with fluconazole but as more literature is produced, systemic antibiotics such as the ones used above may be the treatment of choice.

## **CANDIDA ZEYLANOIDES: CASE REPORT AND REVIEW OF THE LITERATURE**

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Infectious complications caused by *Candida* species have been documented repeatedly, especially in patients receiving parenteral nutrition, corticosteroid or immunosuppressive therapies and in individuals on longterm antimicrobial therapy. However, *C. zeylanoides* has been reported only on a limited number of case reports. To our knowledge this is the first pediatric case reported in the medical literature.

In this case study, we describe a case of a 6 year old girl with history of acute lymphoblastic leukemia that presented with febrile neutropenia with later development of candidemia by this rare species. Treatment involved pulling of her central line and antimicrobials, including micafungin. The incidence of candidemia caused by nonalbicans *Candida* species has been increasing, raising concerns about the emergence of antifungal resistance. Further studies are needed in order to describe pathogenesis and clinical manifestations of *C. zeylanoides* bloodstream infections. This case study adds further data to understand the epidemiology of fungal infections in pediatric cancer patients.

## **CRYPTOCOCCUS LAURENTII FUNGEMIA IN AN IMMUNOCOMPROMISED HOST**

Arafa Ayah

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*Cryptococcus laurentii* (CL) is a yeast that rarely causes infection in humans, but may do so opportunistically. Case reports describe isolation of this organism from both sterile and nonsterile sites. Attribution of infection may be uncertain and, at times, CL may be misidentified, proving to be a different *Cryptococcus* species. There are no randomized treatment trials but both Amphotericin B and fluconazole have been employed successfully. Resistance to fluconazole has been suggested and testing for sensitivity is recommended. We report a case of invasive CL in a patient with lupus and on chronic hemodialysis.

A 79 year old female with renal failure on dialysis, hepatitis C, lupus and dementia, presented with fever and delirium. She was frail and obtunded. Vascular access was removed but not cultured. She had crackles auscultated at the right lung base and ulcerations on the distal lower extremities. Blood cultures grew CL. HIV serology and CSF cryptococcal antigen were negative. The serum cryptococcal antigen was 1:32. Chest xray showed right lower lobe infiltrate with bilateral pleural effusions. Treatment with Amphotericin B was initiated and followed by fluconazole; sequential cryptococcal antigen assays were negative.

While CL may be either a contaminant or an incidental finding (without sign of infection), the clinical presentation and its isolation from a normally sterile fluid would strongly argue for an invasive process. A positive cryptococcal antigen, if present is highly suggestive, and may be used to monitor response to therapy. Amphotericin B is recommended as firstline therapy and can be exchanged with fluconazole if sensitivities and clinical response will allow. If sensitivities are not available, close monitoring is advised. Treatment should be prolonged, but precise recommendations are unavailable. HIV testing and lumbar puncture for CSF analysis is recommended.

**DELIRIUM SECONDARY TO POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME.**

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Posterior reversible encephalopathy syndrome (PRES) is a clinical and radiographic diagnosis with various etiologies that have similar findings on neuroimaging studies. We report a case of delirium secondary to PRES. This patient is a 62 year old female with an extensive past medical history including uncontrolled hypertension, seizures and cerebrovascular accident who was brought to the emergency department by her family after falling out of bed and acting confused. The patient had been noted by her primary care doctor a month prior to have intermittent delirium. On examination the patient was awake but minimally responsive, disoriented and unable to communicate or follow commands. Her systolic blood pressure was above 200, CT scan head revealed bilateral subcortical white matter hypodensity involving the parietooccipital regions, and diagnosis was confirmed by MRI. The patient's delirium was initially treated with antihypertensive medications, and she was discharged with family after hallucinations and delusions improved using antipsychotic medications.

Posterior reversible encephalopathy syndrome is a clinical radiographic syndrome of various etiologies with similar findings on neuroimaging studies. Changes in the brain parenchyma involve edema of the subcortical white matter in the posterior cerebral parenchyma which is best confirmed by hyperintensities on T2 weighted MRI. The most common causes of PRES are hypertension and cytotoxic medications. This condition is reversible with appropriate management of the underlying cause.

**Conclusion**

Posterior reversible encephalopathy syndrome is a clinikoradiologic entity that may present as mental status changes. It is often unsuspected by the physician. The characteristic imaging finding of cortical and subcortical white matter changes on MRI is a key in the diagnosis. Early diagnosis and treatment, in this case by lowering blood pressure and use of antipsychotic medications is essential for the patient prognosis.

**DERMATOLOGIC LESIONS ARISE IN PATIENTS BEING TREATED FOR CANCER; THEY MAY REPRESENT A SIDE EFFECT OF THERAPY.**

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The hand foot syndrome is characterized by painful predominant palmoplantar lesions. The association with different chemotherapy agents has been known for over 20 years.

Capecitabine is frequently associated with hfs and with the recent extension of its use to adjuvant treatment; the incidence of hfs is likely to increase. A 68 year old male with past medical history significant for diabetes mellitus and recent diagnosis of pancreatic cancer (about 4 months ago). Diagnosis of pancreatic cancer was confirmed by histopathology, staging was done (imaging studies).

Patient was evaluated by oncology board (oncologist, surgery oncology and radiation oncology)the patient was found to have pancreatic cancer, stage i b ( t2n0m0).

Which was deemed as unresectable due to general debility, he had ercp and biliary stent was put.Started on radiotherapy and adjuvant chemotherapy (capacetabine).

Six weeks after initiating chemotherapy, he was presented to er with complaints of nausea and vomiting.At that time it was noted that he has skin changes and rash on his hands and feet with peeling. Which the patients stated it has been for few days and it is painful.

Clinical diagnosis of hand foot syndrome was made, discussed with oncologist, accordingly capecitabine was discountioued.

The skin lesions were treated with topical steroids.

Few days later the skin lesions improved and start to heal.

Although that, hfs is a common cutaneous complication of certain chemotherapy; however as a primary care physicians we do not commonly face it. But with extension of chemotherapy use, the incidence is likely to increase and we need to be more familiar with chemotherapy side effects.

## **DIAGNOSIS AND MANAGEMENT OF PREECLAMPSIA**

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Preeclampsia/eclampsia syndrome occurs in about 5% to 8% of pregnancies. Preeclampsia is defined as hypertension and proteinuria with the onset occurring after 20 weeks gestation. Females most at risk for developing preeclampsia are those who are pregnant for the first time. Multiple gestation, hydatidiform mole, diabetes mellitus, age extremes, chronic hypertension, and chronic renal disease are also risk factors for the development of preeclampsia. Other existing medical conditions can confuse the practitioner when trying to diagnose preeclampsia; therefore, obtaining the full clinical picture is of the utmost importance to properly diagnose and manage this dangerous condition.

25yo G1P0000 @36.5wks gestation with severe preeclampsia

Incidence

Etiology of Preeclampsia

Definition and Diagnosis of Preeclampsia

Brief Discussion on Diseases Which Share Similar Lab Results with Preeclampsia

Monitoring Disease Progression and Treating Preeclampsia

Fetal effects of Preeclampsia

**DOPAMINE AGONIST RESISTANT PROLACTINOMA: AN UNUSUAL CASE OF PROLACTINE PRODUCING PITUITARY MACROADENOMA UNRESPONSIVE TO MEDICAL TREATMENT WITH HIGH DOSE DOPAMINE AGONISTS**

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Prolactinomas are the most common hormonally active pituitary tumors. They are treated successfully by dopamine agonist more than 94% of the cases. Resistance is rare and is defined as failure to achieve normal prolactin level and inability to induce tumor shrinkage.

45 year old female presented in April 2010 with 1.52 year history of amenorrhea and visual disturbance. Initial serum prolactin level was over 600ng/ml (Normal 2.829.2ng/ml) with MRI showing a 1.9 x 2.4 cm enhancing suprasellar mass. She was started on medical treatment with Parlodel. Due to lack of response to Parlodel, she was started on Carbergoline. Follow up brain MRI on 7/2010 showed a macroadenoma 2.1 x 2.7 cm (1.9 X 2.4 cm on 4/2010) impinging on optic chiasm and encasing carotid arteries with minimal response to medical treatment. Due to improvement in patient symptoms and absence of headache and neurologic symptoms continuation of medical therapy was recommended by the consulting neurosurgeon. Patient's serum prolactin level responded partially to Carbergoline and decreased to 173ng/ml on 9/2010. Carbergoline dose was increased to 4mg a week and subsequently to 8mg a week with no further decrease in plasma prolactin level. Due to lack of response to medical treatment, neurosurgery is considering possible surgical resection.

Prolactinomas are successfully treated with dopamine agonists in 90-95% of the time. Resistance to medical treatment is seen rarely in these tumors and is associated with DRD2 (Dopamine Receptor) and NGFR (Neuron Growth Factor Beta Receptor) expression. Male gender and cavernous sinus invasion is also associated with resistance to treatment with dopamine agonists. Initial resistance can be overcome by increase in dose or change of medication. Due to the invasive nature of these tumors, treatment with surgical resection or radiation therapy is needed.

**DOUBLE BLOW: OPTIC NEURITIS AND PORN (PERIPHERAL OUTER RETINAL NECROSIS) IN A HIV PATIENT**

Vishnu Garla

MUSOM

To elucidate a case of Ramsay hunt syndrome with optic neuritis preceding the development of peripheral outer retinal necrosis (PORN) in a HIV patient.

A 49 year old female patient with past history of untreated HIV presented with a 2 week history of ear pain, headaches, skin rash, fever and blurred vision. Physical exam revealed decreased visual acuity in the right eye, crusted vesicles in the left ear and a vesicular skin rash on the left side of the face. Zoster meningitis was suspected, Varicella PCR on CSF was positive. MRI showed inflammation of right optic nerve and optic chiasma. Patient was started on acyclovir and steroids. The patient was started on HAART as CD4 count was 10 and the viral load was extremely high. On follow up patient had a facial nerve palsy making the diagnosis of Ramsay hunt syndrome. About a month later the patient woke up with sudden onset blindness in her left eye. A retinal angiogram was done and tpa administered for retinal artery occlusion. Fundoscopy revealed posterior outer retinal necrosis in both eyes. Vitreal aspirate for Zoster PCR was positive. The patient was started on systemic and intraocular ganciclovir and cidofovir. Steroids were given and laser walling was done later. The patient vision in her left eye improved a little but the right eye showed no improvement. Acyclovir will be continued till her immune system reconstitutes.

Varicella has been associated with numerous ophthalmological complications in HIV patients. To our knowledge this is only the second case with the unique combination of Zoster meningitis, Ramsay hunt syndrome with optic neuritis preceding the development of PORN in a HIV patient.

## **ETANTR: A RARE EMBRYONAL BRAIN TUMOR**

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The CNS PNET category comprises a diverse group of entities based upon their histopathological features, which includes medulloepithelioma, ependymoblastoma, CNS neuroblastoma, and CNS ganglioneuroblastoma. A distinctive variant subtype of PNET called, “embryonal tumor with abundant neuropil and true rosettes” (ETANTR) was first reported by Eberhart and colleagues in 2000.

A 3monthold male was admitted to the Pediatric ICU with recent history of nausea, vomiting and general irritability upon presenting to the primary care physician’s office for routine immunizations. A full fontanelle and a large head were noted. There was a positive history of random eye movements and dysconjugate gaze for 2 months. A noncontrast CT of the head was performed that indicated obstructive hydrocephalus secondary to a mass likely arising from within the fourth ventricle. The following day, an MRI was obtained, confirming a left sided posterior fossa mass with severe compression of the brain stem and 4th ventricle. MRI also confirmed multiple metastatic nodules in the spine. A debulking surgery took place with subsequent excision for biopsy of the posterior fossa tumor. A final diagnosis of embryonal tumor with abundant neuropil and true rosettes (ETANTR) was made, a rare subtype of CNS primitive neuroectodermal tumor (PNET).

ETANTRs combine the microscopic features of both cerebral neuroblastoma and ependymoblastoma. The tumors demonstrate fine fibrillary neuropils intermixed with cellular regions and ependymoblastomalike rosettes. Histologically, ETANTR’s combine the unique features of neuroblastoma and ependymoblastoma. Neuroblastoma display neuropils surrounded by HomerWright pseudorosettes, which typically stain GFAP.

Ependymoblastoma, on the other hand, presents with tumor cell arranged in multilayered rosettes consisting of an outer rim of tumor cells merging with the surrounding undifferentiated neuroectodermal cells.

In summary, ETANTR is a rare, recently described entity within the CNSPNET tumor family. The prognosis is extremely poor with the majority of children dying 1 to 30 months postpresentation.

## FOREIGN BODY GRANULOMATOSIS IN INJECTION DRUG USERS

Youhana Greges

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This case describes a 57-year-old male, with past medical history significant for chronic dyspnea and cough presented to the emergency room with transient altered mental status. Initial chest x-ray revealed a large mass-like consolidation in the right upper lobe and this was confirmed with CT scan. Review of systems was also significant for a 40-pound weight loss in the last 6 months. Past medical history was negative for prior tuberculosis exposure and recent travel. Social History was positive for a 40-pack-year history of smoking and admitting to using many types of drugs. Both bronchoscopy with transbronchial biopsy and CT-guided needle biopsy of the lung mass were inconclusive. Aerobic/anaerobic, fungal and mycobacterial cultures were negative. With the persistent lung mass, the patient subsequently underwent an open lung biopsy. This revealed interstitial fibrosis, granuloma formation, and scattered birefringent material associated with foreign body giant cell reaction. Based on the lung biopsy findings the diagnosis of foreign body granulomatous was made.

Foreign body granulomatous lung disease due to injection of talc or cellulose is an unusual condition resulting from the intravenous administration of medications intended for oral use. Patients usually present with nonspecific complaints such as cough, dyspnea, and an increase in sputum production. However, some will be asymptomatic despite abnormalities on chest radiography. In making the diagnosis, chest x-ray and high-resolution CT scan are initially done. Bronchoscopy with transbronchial biopsy and CT scan-guided biopsy can be negative as in our case. Definitive diagnosis is then made with open lung biopsy. There are no clearly established treatments for pulmonary foreign body granulomatosis. Most patients injecting crushed pills containing talc and cellulose appear to have poor outcomes.

**GUIDELINES FOR THE MANAGEMENT OF  
ANTITHROMBOTICS AND ANTIPLATELETS IN  
NONOPERATIVE HEAD INJURED PATIENTS: A CASE STUDY  
AND LITERATURE REVIEW**

Brittany L Venci

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Anticoagulant and antiplatelet therapy has an increasing prevalence in the general population. The Food and Drug Administration estimates 2 million patients start taking warfarin each year and over 31 million prescriptions were written in 2004 alone. The utilization of guidelines for anticoagulated operative patients has resulted in better clinical outcomes. However, a paucity of guidelines for the health care worker in the management of the nonoperative anticoagulated head injured patient remains. Numerous studies have shown anticoagulated patients have an increased morbidity and mortality after sustaining head trauma.

A 56 year old female on anticoagulant therapy presented to the emergency department after sustaining head trauma. The patient subsequently deteriorated and surgical intervention was necessary. This case study will demonstrate the need for clinical guidelines in the management of antithrombotics and antiplatelets in nonoperative head injured patients.

The presented guidelines will stratify anticoagulated head injured patients by utilizing laboratory values, clinical exam and radiographic studies. This data will allow the clinician to assess the patients' risk for an adverse outcome and start appropriate medical management. Thresholds for clinical action will be well defined by International Normalized Ratio (INR) and Platelet Function Assay (PFA) values. Variation in patient exam based on Glasgow Coma Scale (GCS) score and computed tomography (CT) findings will further the stratification. The validity of various management strategies when INR values are less than 1.5, between 1.52 and greater than 2, along with the value of close observation and repeat imaging will be substantiated.

This extensive literature review provides an overview and rationale for the medical management of the anticoagulated nonoperative head injured patient. Implementation of these guidelines allows the clinician to follow a stepwise management strategy based upon clinical evidence and offers insight into the clinical decision making process to promote performance improvement, patient safety and improve outcomes.

## **HEMIBALLISMHEMICHOREA: A RARE MANIFESTATION OF DIABETIC KETOACIDOSIS**

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Diabetes Mellitus is a common disorder with multiple complications and varied manifestations including CNS. Acute presentation with HemiballismHemichorea has been described infrequently in the literature usually related to nonketotic hyperglycemia. We describe here a case of new onset HemiballismHemichorea associated with Diabetic ketoacidosis (DKA).

A 72 year old male, with history of uncontrolled Diabetes Mellitus Type 2, and multiple past admissions for DKA, presented with uncontrollable left upper and lower extremity jerking movements for 2 days. Blood sugar was 871mg/dl, Anion gap was 25, Bicarbonate was 14, and HgbA1C 14.9. The patient was admitted to the MICU for management of DKA. Exam was unremarkable for any focal deficit, but showed left upper and lower extremity choreiform movements. CT scan of the head revealed an increased signal in the right basal ganglia. There was no evidence of CVA, even on repeat imaging. MRI was not performed due to the presence of his pacemaker. EEG was negative. Aggressively treated with intravenous insulin and rehydration and Clonazepam. His symptoms significantly improved and then resolved with normalization of blood glucose levels. A diagnosis of HemiballismHemichorea secondary to hyperglycemia was made after ruling out other secondary causes.

Hyperglycemia, mostly nonketotic, has been associated with HemiballismHemichorea, which in rare instances, has been described with DKA as well. The pathophysiology is not well understood, many theories have been suggested, including ischemia, calcification, osmotic demyelination syndrome, and genetic predisposition. Blood glucose control has been associated with rapid resolution of the HemiballismHemichorea in most reported cases, but rarely, it could persist for several months.

### **Conclusion:**

HemiballismHemichorea is a rare manifestation of hyperglycemia. HemiballismHemichorea in this setting can be usually reversed by optimizing glycemic control. Further research is needed to identify the underlying pathophysiological mechanism.

## HEPATOCELLULAR CARCINOMA

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Hepatocellular carcinoma is the main cause of primary liver cancers but is rare in the United States. HCC is mostly associated with hepatitis B or C and cirrhosis. In this case, a patient with several chronic health problems developed hepatocellular carcinoma and how it was unintentionally discovered will be discussed.

The patient presented to her gastroenterologist for followup with abdominal pain and chronic constipation. A CT scan August showed the patient had portal vein thrombosis and diverticulosis with inflammation along with two two hemangiomas. On this followup visit, the patient complained of GERD symptoms and nausea and stated she had lost 15 pounds due to a poor appetite. Patient didn't have any jaundice, fever, hematemesis, diarrhea or constipation. She hadn't consumed any alcohol recently either. Her labs from previous hospital stays and office visits did not indicate liver dysfunction.

In October 2011, the patient was admitted again to Cabell Huntington Hospital due to chest pain. During this time, the patient continued to complain of abdominal pain. During her time in the hospital, it was noted that her liver enzymes were becoming higher and as a result a liver biopsy was ordered to determine if a fatty liver or hepatitis C was causing her problems. A liver biopsy was ordered and the pathologist discovered the patient had hepatocellular carcinoma.

The diagnosis of hepatocellular carcinoma depends on several diagnostic factors. The tumor markers AFP was not abnormal. Since the patient presented with an enlarged and tender liver on physical exam along with a new increase in liver enzymes with a past history of a hepatitis C infection, a liver biopsy was ordered to determine if she had a fatty liver or fibrosis which led to the surprise discovery of cancer.

**HEREDITARY NEPHRITIS (ALPORT SYNDROME) PRESENTING IN A MIDDLE AGED WOMAN AS CRAMPS**

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A 44 year old female presented to her primary care with a chief complaint of cramping in her legs. She had been otherwise asymptomatic. She was found to be in acute renal failure with a BUN of 88 and creatinine of 7.57. She had a past medical history positive for hematuria that she has had all of her life. She underwent a kidney biopsy when she was 5 years old, but, according to the patient, was inconclusive. Furthermore, she has sensorineural hearing loss that she has had all of her life as well and a family history positive for a father that had sensorineural hearing loss. The physical examination was unremarkable. ANCA panel, ASO, Complement C3,C4, and ANA were all negative. She underwent kidney biopsy which showed focal segmental glomerulosclerosis and several foci of severe acute tubular necrosis. Furthermore, there was segmental basement membrane thinning and segmental irregular thickening with laminations in the lamina densa. She was subsequently started on hemodialysis and was discharged home with instructions to have dialysis as an outpatient.

The differential for persistent hematuria is relatively short. There are three common players when it comes to persistent hematuria: IgA Nephropathy, Alport Syndrome and Thin Basement Membrane Nephropathy. On kidney biopsy the glomeruli had no staining with antisera associated with IgA. Furthermore, thin basement membrane nephropathy rarely progresses to acute renal failure or chronic kidney disease. Also, the Type IV Collagen immunofluorescence did not support the diagnosis of Alport Syndrome. However, women who are usually carriers of the disease have variability of gene expression due to lyonization. Given the irregular thickening and laminations of the lamina densa, Alport Syndrome seems to be the most likely diagnosis. However, this can not be confirmed or denied without appropriate genetic testing.

## **ISCHEMIC STROKE AFTER MINOR HEAD TRAUMA IN A 19 MONTH OLD: A UNIQUE MECHANISM OF STROKE.**

Vishnu Garla

MUSOM

To present an interesting case of pediatric ischemic stroke in a 19 month old as a result of minor head trauma.

A 19 month old male child fell from a height of about three feet, striking right side of his head on the bare floor. The child immediately cried, had no loss of consciousness and had noneurological deficits. By the following day he had developed decreased consciousness and left hemiparesis. Was brought to the ER where CT scan of the head showed hypodensities in the posterior limb of the right internal capsule. CTA was normal. The child then developed a left facial droop and dysphagia. MRI revealed infarction of the right basal ganglia, internal capsule and caudate nucleus. Further workup, including echocardiogram and hypercoagulability workup were normal. On follow up two weeks later the facial paresis had resolved. While the left lower extremity showed an increase in gross voluntary movements, the left upper extremity showed only a minimal increase and was held in a flexed position.

Ischemic stroke in children has a variable incidence with studies quoting it from 23/100,000 to 13/100,000. Prothrombotic disorders, arterial dissections, congenital heart disease, sickle cell disease, prior chickenpox and head trauma have been identified as risk factors. Middle cerebral artery is most commonly involved. In children below 18 months, minor head trauma can cause ischemia of the basal ganglia leading to contra lateral facial palsy and hemiparesis. Occult dissections, microscopic intimal trauma, and vasospasm have been implicated. Diagnostic workup includes MRI, angiography, hypercoagulability work up and echocardiogram. Treatment of idiopathic stroke is generally conservative. The deficits generally resolve over 36 months.

## **MYASTHENIA GRAVIS IN PREGNANCY**

Ashleigh Keats

Joan C. Edwards School of Medicine, Huntington, WV.

Myesthenia Gravis is an autoimmune disease identified by muscle weakness and fatigue. Pregnant women with myesthenia gravis are at increased risk for having pregnancy related complications and adverse neonatal outcomes. Pregnancy changes can also affect myesthenia gravis and the disease progression.

We describe a 19 yo Gravida 2, Para 0 woman with myesthenia gravis that was diagnosed before her second pregnancy. During pregnancy, the patient was receiving IVIG once a month and taking prednisone, Cellcept, and Robinul to decrease her chances of have a myesthenic crisis during pregnancy. Patient presented to the hospital at 38 weeks and 5 days gestation in active labor. Patient received an epidural prior to delivery. She delivered vaginally shortly after admission with anesthesia, neurology and an obstetrician present through the entire delivery. Labor, delivery, and peripartum periods were free from myesthenic crisis.

Mysthenia Gravis in pregnancy is a serious condition and can create serious complications during antepartum, labor, and postpartum periods, including myesthenic crisis. It is necessary that these patients be followed very closely by an obstetrician and a neurologist throughout pregnancy. It is also recommended that pregnant women with myesthenia gravis have an anesthesia consult prior to delivery.





**POSTER PRESENTATIONS • SESSION II • 2:30 PM – 3:15 PM**

# 24TH ANNUAL RESEARCH DAY POSTER SESSION

**PAPILLEDEMA AND INCREASED IODINE UPTAKE IN THE EYE:  
A RARE COMPLICATION AND A UNIQUE PRESENTATION**

Vishnu Garla

MUSOM

Thyroid disease has been associated with numerous eye conditions. We present a case of papilledema and increased radioactive iodine uptake in a papillary carcinoma thyroid patient undergoing radioactive iodine ablation. A 40 year old male patient noticed a neck mass while shaving. CT neck revealed a 2 cm mass from the superior pole of the left thyroid lobe, and a 4 cm calcified mass inferior to this. FNA biopsy of the thyroid nodule was consistent with metastatic papillary thyroid cancer. He subsequently had a total thyroidectomy and modified radical neck dissection. Pathology revealed papillary thyroid cancer with tumor capsular invasion. Following surgery, thyroid hormone withdrawal was initiated in preparation for radioactive iodine ablation. Post therapy I131 WBS showed intense uptake in the right eye. He also complained of redness and photophobia in the right eye and was referred to ophthalmology. Funduscopy revealed papilledema. MRI of the brain was normal but LP done showed a high opening pressure but otherwise normal fluid analysis.

Papilledema resulting from increased intracranial hypertension has been reported both in patients with hypothyroidism as well as those who underwent neck dissection. Hypercoagulability and increase in CSF protein are some of the mechanisms implicated in the pathogenesis. Radioactive whole body scans are very useful in the diagnosis of occult thyroid metastasis, however false positives may occur. We think our patient developed intracranial hypertension from the combination of neck dissection as well as iatrogenic hypothyroidism from the thyroid hormone withdrawal. The increased uptake was likely due to underlying inflammation of the optic disc.

To our knowledge this is the only case of papilledema and increased iodine uptake in the eye secondary to radioactive iodine ablation.

**PATTERN RECOGNITION: A CASE OF ISOLATED POSTERIOR MYOCARDIAL INFARCTION.**

Dana Lycans

Department of Internal Medicine, Joan C Edwards School of Medicine, Huntington, WV.

Posterior myocardial infarction (PMI) is a relatively common form of myocardial infarction occurring in up to 20% of infarctions, while isolated PMI is estimated to occur in only about 7% of STEMIs. This can sometimes be missed with the standard 12lead electrocardiogram. We present a case of PMI and discuss the common manifestations and electrocardiogram changes associated with this disease.

This is a 67yearold Caucasian male with a history of coronary artery disease status post coronary artery bypass graft (CABG) with multiple Percutaneous coronary interventions (PCI) with stent placement, who was transferred back from the cardiac center after been evaluated for chest pain and elevated cardiac isoenzymes (CIE) and underwent PCI. On same day of returning to the admitting facility, the patient complained of recurrence of his chest pain, and was noted to have elevated CIE. Electrocardiogram revealed a new STdepression in leads III, V3, V4, V5, and V6. The patient was diagnosed with PMI and underwent urgent revascularization therapy.

Posterior myocardial infarction is not always easy to diagnose. The presentation can be atypical, and can be missed on a standard 12lead EKG. STdepression in V13, R waves in V13, and/or prominent upright T waves in V13 are a few of the changes may be observed. A 15lead EKG is indicated to show the STsegment elevation in posterior leads.

**PEPTO BISMUTH INDUCED NEUROTOXICITY: RARE SIDE EFFECTS OF A COMMONLY USED MEDICATION.**

Eyad Nazer

Department of Internal Medicine, Joan C. Edwards School of Medicine, Huntington, WV.

A 56 years old female with medical history significant for collagenous colitis and gastroesophageal reflux disease (GERD) for which she was taking Pepto Bismuth for months. She presented with progressive confusion for two weeks, followed by myoclonus, tremors, gait instability and visual hallucinations. Patient was admitted and comprehensive work up was done over a ten day course. This included a complete blood count (CBC), comprehensive metabolic panel (CCP), computed tomography (CT) head, magnetic resonance imaging (MRI) brain, electroencephalography (EEG), lumbar puncture, and various antibody and serology testing which were all essentially unremarkable. It was noted that patient had been taking over the counter Pepto Bismuth chronically for gastrointestinal symptoms. Based upon the unrevealing work up, serum and urine samples for Bismuth levels were sent and returned markedly positive in both samples. Bismuth was held on admission and over the ten day hospitalization, patient showed gradual improvement of her cognitive function. She also showed resolution of her abnormal movements, myoclonus and visual hallucinations. Her gait continued to improve and required extended period of physical therapy post discharge. Her subsequent follow up visits showed resolution to baseline at four months post discharge. This case is to make others aware of this rare side effect profile of a commonly used medication.

## **RADIATION ASSOCIATED PELVIC FRACTURES: REPORT OF FOUR CASES**

Mahshid Mohseni

Marshall University Department of Internal Medicine

High dose radiation is used for treatment of variety of malignancies. It has deleterious effects of bone metabolism and has been associated with fractures. Treatment of these fractures is difficult due to the concerns about the use of antiresorptive and anabolic agents in this group of patients.

Case 1: 76 year old female presented with bilateral sacral and pubic rami fractures two years after radiation for cervical cancer. She had been on bisphosphonates previously. Bisphosphonates were stopped and patient was offered Forteo (PTH) but patient decided not to proceed due to the increased risk of sarcoma. The fracture was treated non operatively and the patient's symptoms resolved.

Case 2: 76 year old female presented with bilateral sacral insufficiency fractures one year after radiation for rectal cancer. The patient was on bisphosphonates before and it was discontinued after the fracture. The fracture was treated non operatively and the patient's symptoms improved.

Case 3: 65 year old female with a history of radiation for endometrial cancer presented with bilateral pubic rami fractures. Due to osteoporosis on DEXA scan she was placed on IV bisphosphonates. The follow up showed improvement in symptoms, bone mineral density, and no evidence of new fractures.

Case 4: 82 year old male that presented with pubic rami fractures 7 years after radiation for prostate cancer. He had been on bisphosphonates that were stopped for one year. Patient became asymptomatic and the fracture showed radiographic healing after one year.

Radiation associated fractures are difficult to treat due to high rate of non union and paucity of literature on treatment guidelines. Antiresorptive therapy can delay fracture healing and has been associated with fractures with prolonged use.

Anabolic agents have been associated with increase chance of sarcoma in irradiated bone. The medical treatment of these fractures is currently evolving.

## RARE CASE OF PITUITARY ADENOMA CO SECRETING TSH AND GH

Hani Alkhankan

Marshall university/ Internal medicine

Thyroid stimulating hormone (TSH)secreting pituitary adenomas are rare and comprise less than 1% of all pituitary tumors.

We present an unusual case of a pituitary adenoma cosecreting TSH and GH with signs of hyperthyroidism and acromegaly.

This is a 61 yr old female patient who presented with palpitations, weight loss, sweating. Patient was on synthoid for few years for “elevated” TSH. Patient also complained of enlargement of her hands, increased shoe size, as well as coarse facial features. Lab values obtained following the discontinuation of synthoid for several months showed elevated TSH, free thyroid hormones, GH and IGF1

MRI of the brain showed a 2.1x1.9x 2.2 cm pituitary mass with superior extension into the optic chiasm, lateral extension into cavernous sinus and left internal carotid artery.

Patient underwent transphenoidal resection; pathology report was consistent with plurihormonal growth hormone secreting adenoma.

TSH secreting adenomas (TSHomas )secrete biologically active thyrotropin in an autonomous fashion. Among TSHoma patients, 71% secrete TSH alone and 29% cosecrete other pituitary hormones. The most common cosecreted hormone is the GH.

The molecular basis of TSH secreting adenoma is still not well known, but molecular analysis of these adenomas has shown that there is some association with overexpression of pit specific transcription factor 1, as well as somatic mutations in thyroid hormone receptor beta gene.

The first treatment option in TSHomas and somatotropinomas is surgery. Pituitary radiotherapy and/or medical treatment with somatostatin analogs are two valid alternatives if surgery is contraindicated, declined or fails.

In conclusion, TSH secreting pituitary adenomas are a rare cause of hyperthyroidism. The diagnosis should be considered in patients with normal or elevated TSH and elevated free thyroid hormones.

**RELAPSE AFTER 40 YEARS, FOLLICULAR NONHODGKIN'S LYMPHOMA REOCCURRING AFTER 40 YEARS FROM TREATMENT**

Tilahun Belay

Department of Internal Medicine, Joan C. Edwards School of Medicine, Marshall University

Follicular NonHodgkin's lymphoma (FNHL) is a cancer of the lymph system that can start at any part of the body with 40 to 100 % complete remission achievement with appropriate chemotherapy. The vast majority of relapses occurs in first 2 years after therapy. We report a case of Follicular NonHodgkin's lymphoma relapsed after 40 years post treatment.

This is a 70 year old white man, presented with right inguinal swellings, he denied any fever, anorexia or weight loss. Patient has past medical history of Follicular NonHodgkin's lymphoma diagnosed when he was at age 30, that was treated with radiation therapy. Subsequently, he underwent excisional biopsy of the inguinal lymph node that revealed follicular NHL. With further work up , the patient was staged as Stage IV Grade 12/3 Follicular Cell NHL. He had a successful second remission after treated with chemotherapy.

Follicular cell Lymphoma is one of the most indolent forms of malignancy. Late relapse can occur up to 40 years after treatment.

## **RESISTANT PROLACTINOMA: AN UNUSUAL CASE OF PROLACTINOMA UNRESPONSIVE TO MEDICAL TREATMENT WITH HIGH DOSE DOPAMINE AGONISTS**

Mahshid Mohseni

Department of Internal Medicine, Section of Endocrinology, Joan C Edwards School of Medicine, Huntington, WV

Prolactinoma is the most common functional pituitary tumor. It is usually treated medically with dopamine agonist therapy. We are presenting a case of dopamine agonist resistant prolactinoma (DARP).

A 45 year old lady presented with amenorrhea for 2 years and recent visual disturbance. Physical examination showed bitemporal hemianopia superiorly without optic nerve atrophy. Laboratory data revealed serum prolactin level 617ng/ml (Normal 2.829.2ng/ml). MRI showed a 1.9 x 2.4 cm enhancing suprasellar mass consistent with pituitary macroadenoma. She was initially started on Parlodel but later on switched to cabergoline due to lack of complete response. Patient's serum prolactin level responded partially to Cabergoline and decreased to 173ng/ml in few weeks. Follow up MRI in 3 months showed a macroadenoma 2.1 x 2.7 cm without any significant change from previous study. Due to improvement in neurologic symptoms and partial decline of prolactin levels, continuation of medical therapy was recommended by the consulting neurosurgeon. Cabergoline dose was slowly titrated up to 8mg per week with no further decrease in plasma prolactin level. Due to lack of complete response, and higher cost and risk of side effects of long term high dose dopaminergic therapy patient was referred to surgical debulking of tumor.

### Discussion:

Prolactinomas are successfully treated with dopamine agonists in 90-95% of the time. Resistance to medical treatment in these tumors is associated with reduced density of Dopamine Receptor D2 and or altered Neuron Growth Factor Beta Receptor gene expression. Resistant tumors are more invasive with higher mitotic index and usually associated with cavernous sinus invasion. Initial resistance can be overcome by increasing the dose (up to 11 mg/wk) or switching to another dopaminergic agent. Due to the invasive nature of these DARP, treatment with surgical resection or radiation therapy is needed.

## **SEVERE PANCYTOPENIA SECONDARY TO VITAMIN B12 DEFICIENCY**

Lisa Bajpayee

Joan C. Edwards School of Medicine

This clinical case highlights severe B12 deficiency as a rare etiology for pancytopenia.

A 60-year-old female presented to the ED with generalized weakness, of ten days duration, nausea, vomiting, decreased appetite, and an unintentional 25-pound weight loss for the past several months. Her diet consisted of a small amount of pudding. The patient's husband died in 2007, and since that time, the patient has felt "very sad" and has not left her house in over three years. The patient's neurologic exam revealed CN I-XII grossly intact, motor and sensation intact throughout, and 3/5 strength in her upper and lower extremities, bilaterally. Laboratory evaluation included a complete chemistry panel, liver function tests, BNP level, Coombs test, antinuclear antibody, and infectious screen, all of which were unremarkable. The patient's CBC exhibited severe pancytopenia and a psychiatric evaluation found that she met the DSM-IV criteria for Major Depressive Disorder. The patient's folate level was within normal limits, however, her B12 level was dramatically low, thus evoking parenteral B12 treatment. Two days following B12 treatment, a bone marrow biopsy revealed a hypercellular bone marrow with trilineage dyspoiesis, which was consistent with pancytopenia secondary to Vit B12 deficiency. The patient's B12 deficiency stemmed from her poor nutritional intake secondary to her depression. The patient continued B12 treatment in an outpatient setting, and during a 3-week follow-up visit, the patient's CBC was found to be completely normal and the patient reported full resolution of her diffuse weakness.

In rare cases, pancytopenia can be caused by B12 deficiency. B12 deficiency is a common phenomenon in the elderly and affects 10-20% of people over the age of 60 in the U.S. Given this prevalence, any patient over the age of 60 presenting with pancytopenia should be promptly evaluated for B12 deficiency so as to avoid devastating consequences.

**STREPTOCOCCUS PNEUMONIAE BACTEREMIA/SEPTICEMIA.**

Hani Alkhankan  
Marshall University.

*Streptococcus pneumoniae* is the most common cause of community-acquired pneumonia (CAP), and it also accounts for 66 percent of bacteremic pneumonias.

We are presenting an unusual case of *Streptococcus pneumoniae* Bacteremia in an immunocompetent elderly patient with no obvious source of infection and no history of iv drug abuse.

A 83 year old female with a past medical history of interstitial lung disease, Afib, Congestive heart failure, valvular heart disease, Alzheimer's disease, and hypothyroidism, who presented complaining of Shortness of breath, chills and altered mental status for one day. She had no cough, sputum production or Fever. She had an elevated WBC of 23,000, and her CXR showed no signs of pneumonia. Mycoplasma, legionella profiles and Strep Pneumo urine antigen test were negative, Blood culture was positive for *Streptococcus pneumoniae* after 19 hours, and patient was started on Rocephin. She underwent Transesophageal echocardiogram which showed no signs of endocarditis. Patient was switched to PO Augmentin afterwards for 2 weeks. Repeat blood cultures turned negative and she was discharged home.

It is difficult to dismiss *Streptococcus pneumoniae* growing in blood cultures due to it is not being a skin or mouth colonizer, it is difficult for it to be a contaminant. Furthermore, the Leucocytosis is not specific makes interpretation of this data for monitoring acute infection difficult. CXRs/and pneumonias profile screens were not consistent with pneumonia as a source. One possible other source for the bacteremia might be an infected joint but this was not obvious on exam and records reveal no surgically implanted prostheses.

**Conclusion:**

This is an unusual case of *Streptococcus pneumoniae* bacteremia in an immunocompetent patient with an inability to define obvious source, it is difficult to be a contamination. Which is a rare finding in this case

**SUPERIOR VENA CAVA SYNDROME: CONCURRENT COPD  
CONFOUNDS THE PROMPT DIAGNOSIS OF SVC SYNDROME**

Gargi Bajpayee

Internal Medicine Department at Marshall University School of Medicine

Superior Vena Cava (SVC) syndrome consists of a variety of symptoms that result from the occlusion of the superior vena cava. Subsequently, an increase in venous congestion manifests as edema of the arm, neck, and head. In the preantibiotic era, infection was the main culprit for SVC syndrome, whereas in today's age, intrathoracic malignancy is the primary cause.

A 63 year old female with a past medical history significant for Chronic Obstructive Pulmonary Disease presented to the Emergency Department with increased shortness of breath and right arm, right breast, and facial swelling. Four months prior, the patient was seen at her primary care physician's office for evaluation of increased dyspnea and facial swelling—her symptoms were attributed to worsening COPD and possible dental carries, respectively. Upon admission to the ED, routine chest xray revealed a mediastinal mass. Subsequent CT with contrast of the chest was performed and showed complete occlusion of superior vena cava by a superior mediastinal mass and a subsegmental pulmonary embolism. The patient was admitted to the hospital for further workup; CT biopsy of the mediastinal mass revealed small cell lung carcinoma. Further workup and staging included a head CT (with and without contrast) which showed an enhancing mass lesion located in the left parietal lobe, consistent with brain metastasis. After discussion of treatment options, patient received chemoradiation therapy.

COPD patients frequently present to their PCP with worsening respiratory symptoms and recurrent COPD exacerbations. When symptoms of facial swelling coexist, a high degree of clinical suspicion as well as aggressive patient workup allows for the early recognition and treatment of superior vena cava syndrome secondary to malignancy. An astute clinical eye can therefore help to reduce the progression of poor outcomes.

**TAKOTSUBO SYNDROME IN A POSTMENOPAUSAL FEMALE**

Ayah Arafa and Supria Batra

Joan C. Edwards School of Medicine

Takotsubo syndrome (TS), or stress-induced cardiomyopathy, is a transient cardiac syndrome involving left ventricular apical dyskinesia. “Takotsubo”, Japanese for an octopus trap, implies the apical ballooning configuration of the left ventricle in systole; commonly seen in the disorder. TS is interesting in that its presentation and diagnostic workup can often lead clinicians into mistaking it for an acute coronary syndrome. Although the etiology is unclear, several theories have been proposed including one believing it to be induced by catecholamines released due to intense emotional triggers, hence its other name: the “broken heart syndrome”. We report a case of the unique TS to contribute to the ongoing efforts in better understanding its unknown etiology.

A 62-year-old female with past medical history of hypertension presents with elevated blood pressures and bradycardia with heart rate in the 50's. The patient also complained of left-sided chest pain of 3 days duration. Pain was stated to radiate to the right side, relieved upon rest. Patient was ruled out for myocardial infarction with three sets of negative cardiac enzymes. EKG demonstrated RSR prime pattern in lead V1, and some mild ST segment elevation in V2. Cardiology initially diagnosed her with NSTEMI, and subsequently sent for left heart catheterization. Upon cath, patient was noted to have no significant obstructive coronary artery disease; but was found to have reduced left ventricular systolic function with wall motion abnormalities consistent with TS. Cardiac rehabilitation was initiated, and patient was placed on Coreg, Norvasc, and Zestril. The patient was discharged after three days.

TS is a rare transient cardiac syndrome characterized by left ventricular apical dyskinesia with an increasing occurrence in literature. Due to the fact that TS presents identical to an acute coronary syndrome, its diagnosis can be missed by clinicians, therefore increasing awareness of the syndrome is crucial.

**UNCOVERING THE MYSTERY OF A LIP SWELLING, AN EXTRAGINGIVAL PYOGENIC GRANULOMA.**

Rezwan Ahmed

Department of Internal Medicine, Joan C. Edwards School of Medicine, Marshall University

Pyogenic granulomas are benign capillary mucosal and skin lesions that arise in localized areas of irritation. They appear as small, colored pinpoint areas that grow to the size of 2mm-2cm in diameter over days to weeks. In 75% of cases, pyogenic granulomas are found within the gingiva. Rarely, they appear as extralingival masses on the lips.

A 62 year old Caucasian male with a past medical history significant for Barrett's Esophagus and Tubular Adenoma comes to the Emergency Department (ED) complaining of a bleeding mass outside the lower lip. The patient said that he first noticed the mass one month prior and it has gradually increased to the size of a small marble. The patient denies trauma to the site but admits to using smokeless tobacco, which he has stopped secondary to the mass causing difficulty eating. The lesion suddenly started to bleed prior to his ED arrival and soaked his clothing. A 2x2 cm erythematous mass with a stalk affixed to the lower lip and dried blood superior to the mass is excised in the Emergency Room and the specimen is sent to pathology for analysis. that revealed Pyogenic Granuloma.

Pyogenic granulomas are vascular skin lesions that are commonly found in females during the second decade of life. They are associated with localized trauma and may mimic neoplastic skin conditions. This case represents a patient who presents in an acute setting with a rare, extralingival presentation of a pyogenic granuloma. To appropriately manage and treat this skin condition, healthcare providers must maintain a high degree of clinical suspicion.

## **VARICELLA ZOSTER VIRUS MENINGITIS IN A IMMUNOCOMPETENT HOST: A CASE REPORT OF AN UNEXPECTED ETIOLOGY**

Kari Wilson

Section of Infectious Diseases, Joan C. Edwards School of Medicine,  
Huntington, WV

Varicella zoster virus (VZV) is a common illness in childhood characterized by a disseminated vesicular rash, lymphadenopathy and constitutional symptoms. In approximately 33% of adults, a recurrence, usually presenting as a dermatomal rash and associated pain, at times severe, may occur. Other atypical manifestations, including a recent attribution as a cause of Guillain Barre disease, may prove difficult to diagnose. One example would be aseptic meningitis due to VZV where there is often delayed or absent rash but cerebrospinal fluid (CSF) discloses inflammation without microbial growth. We describe a case of VZV aseptic meningitis and current diagnostic and therapeutic issues.

A 28yearold male presented with headache and photophobia. Examination was remarkable for photophobia and an erythematous rash at T1011 radiating from back to left flank. CXR and CT scan of the head were without abnormality. The CSF was pleocytotic, predominantly lymphocytic, and the protein level was elevated. CSF grew coagulase-negative staphylococcus. Antibiotics were discontinued and acyclovir administered. HIV and arboviral serologies were negative as were viral skin and enteroviral surveillance cultures. The polymerase chain reaction (PCR) assay for herpes simplex virus 1 was negative, but the varicella zoster virus PCR was positive. Acyclovir was discontinued and the patient recovered fully.

VZV meningitis occurs with unknown frequency in patients with previous history of VZV. As the condition is usually self-limiting, and symptoms and findings are nonspecific, the diagnosis may be secured only by heightened awareness and the exclusion of other etiologies. The VZV PCR is both highly sensitive and specific, with a high positive predictive value. It is not known if antivirals are either needed or useful in the immunocompetent host, but it would appear that supportive treatment is sufficient. Testing for HIV is recommended. If warranted, the diagnosis for an immunodeficiency should be sought.

## **ANATOMY OF SYNDESMOTIC CARTILAGE: WHERE CAN A SYNDESMOTIC SCREW BE PLACED TO AVOID DAMAGE TO THE SYNDESMOSIS CARTILAGE?**

Daniel Woods

MUSOM

Anatomic reduction of unstable ankle fractures with concomitant syndesmotic injury is the goal of surgical fixation with reduction paramount in predicting future outcomes. One key principal is avoidance of iatrogenic cartilage damage with surgical fixation. Syndesmosis injury in ankle fractures is common. This research project is designed to provide clear anatomical landmarks to help avoid iatrogenic injury to the tibiofibular contact zone during surgical fixation. The tibiofibular contact zone is a discrete anatomical structure. The contact zone consists of hyaline cartilage; the articular facet of the distal fibular malleolus and the continuation of the articular cartilage of the tibial plafond.

Preliminary cadaveric dissections were carried out to assess the proximal lateral extent of the distal tibia articular cartilage within the tibiofibular contact zone on 3 specimens from the Marshall School of Medicine. We have noticed that there is a discrete area of smooth bone that can easily be noticed and measured even in specimens without remaining articular cartilage. We will plan on using the Smithsonian bony register to view a high volume of specimens to obtain the power to adequately and accurately describe the TFCZZ.

Data from these three cadavers show that the distal tibia articular cartilage within the contact zone extends  $1.5 \pm 0.2$  cm above the plafond. Additional resources are needed to more fully map the location (width, length and area) of the tibiofibular cartilage contact zone (TFCCZ).

In conclusion, clarification of the anatomy of the TFCCZ, can help a surgeon avoid placement of transsyndesmotic fixation through an area of articular cartilage. This study needs to be completed to firmly establish the extent of the tibiofibular contact zone prior to completion of any study dealing with the effect of location of transsyndesmotic and patient outcomes.

## **ANTIBIOTIC LIKE ACTIONS OF VITAMIN D**

Joshua Hendrix, Sammy Hodroge, Adam Short  
Department of Orthopedics, Joan C Edwards School of Medicine,  
Huntington, WV \*Medical Student, JCESOM

Vitamin D is a secosteroid hormone that has expanding importance for healthy lifestyle and disease prevention. A multitude of studies have highlighted that vitamin D acts not only in bone and calcium homeostasis but is critically important for human immunity. The discovery that the storage form of vitamin D (25hydroxyvitamin D3) can be locally converted to the active form (1,25hydroxyvitamin D3) in immune system cells, epithelial cells and numerous other nonrenal tissues highlights the importance of keeping sufficient stores. When responding to a specific external stimulus, like bacterial invasion, autocrine synthesis of active vitamin D has the ability to regulate gene expression providing a specific response directing cellular actions. These responses include the generation of antimicrobial peptides with production dependent on the individuals' vitamin D status with vitamin D deficiency associated with increased rates of infection. This paper highlights the antibiotic like actions of vitamin D and importance of vitamin D sufficiency.

## **ARE THE DEFINING MARKERS OF SIRS ASSOCIATED WITH THE ISOLATION OF PATHOGENIC BACTERIA?**

Ahmad R. Nusair

Joan C. Edwards School of Medicine, Marshall Univeristy

Blood cultures(BCs)are frequently ordered in the ICU, often triggered by the presence of one or more parameter of Systemic Inflammatory Response Syndrome (SIRS).

We reviewed BCs orders in our ICU between 06/08 & 06/09. With each order, we reviewed temperature, white blood cell(WBC)count, and blood pressure(BP)values within the preceding 24 hours. For each order we examined the relationship between the isolation of true pathogenic bacteria (TPB) and fever(temperature > 101F), hypotension (sBP< 90mmHg), and leukocytosis (WBC> 11K) using a random effects logit multivariate model with true positive BCs as the dependent variable.

There were 377 patients with 658 sets of BCs performed (average of 1.8 sets per patient) and 68 of these positive for PB. Average age was 57.7 years (sd 18.8 years) and 56.4% were male.The average length of stay was 14.7 days (sd 13.2 days). For those who had more than one order for Bcs, the average time between the two orders was 2.5 days (sd 3.3 days). Leukocytosis was present for 81.6% of the BCs ordered, followed by fever (33.9%) and hypotension (31.9%), respectively. Hypotension was significantly associated with true positive BCs(OR 2.2; 95% CI 1.23.9), but neither leukocytosis(OR 0.66; 95% CI 0.331.31) nor fever (OR 1.1; 95% CI 0.582.00) were associated when all were included in the multivariate model along with age and gender. Hypotension remained a significant predictor of true positive BCs even after excluding the initial set of BCs obtained (OR 2.2; 95% CI 1.04.9, p=0.05).

The presence of one or more parameters of SIRS should prompt a thorough evaluation to determine if the underlying pathology is infectious in nature. The yield of BCs for TPB is rather low and was not associated with fever or leukocytosis, but hypotension upon admission to the ICU or thereafter while in the ICU was predictive of septicemia.

## ASSOCIATED FINDINGS IN THE PATIENT WITH DKA: A WAKE UP CALL.

Elke Fahrmann

[1] Department of Internal Medicine, Joan C. Edwards School of Medicine, Marshall University; [2] Department of Mathematics, Marshall University  
One of most common and serious complications associated with Type 1 diabetes is Ketoacidosis (DKA). Associated with Ketoacidosis are detrimental health issues and burdensome financial costs.

Precipitants of DKA include onset of DM and acute illnesses such as pneumonia. However, who is the adult patient who is prone to diabetic acidosis??? Does DKA affect morbidity/mortality in the longterm, and what DKA characteristics are important in this case?

We analyzed medical records to identify characteristics of T1DM patients who experienced DKA events during 2001 to 2011 and what factors contributed to the outcomes. Statistical methods included COX regression, multi and univariate analysis. So far we have identified 406 T1DM patients (~40% with DKA events) followed by IM/FP MU physicians.

Drug/alcohol abuse, smoking, gastrointestinal and psychological disorders, socioeconomic status, pancreatitis, BS control and advanced kidney disease are risk factors for DKA events. Age and DM duration are protective factors. Gender and other comorbidity factors didn't affect the risk of DKA events.

Noteworthy, smoking increases the risk of gastrointestinal disorders and depression. Patients who exercise smoke significantly less than their counterparts. Drug/alcohol abuse history is significantly associated with both anxiety plus depression and smoking.

In the short and longterm, DKA seems to affect the T1DM lifespan. Investigation about DKA factors affecting mortality/morbidity are still ongoing. DKA, a common serious DM complication, is associated with several risk factors. It seems to affect mortality in the acute and nonacute settings.

We have a real chance to fight against DKA. The KEY: TEAM work PCP, specialist, MHP and social worker.

We recommend routine drug screening in patients who are admitted with a diagnosis of DKA especially if red flags exist. Positive results may warrant admission to rehabilitation centers and follow up with MHP.

We strongly recommend the combined treatment approach of depression and smoking cessation and recommend referral to established exercise programs (example CHH).

## COMMUNITY HOSPITAL EXPERIENCE WITH SILS CHOLECYSTECTOMY

Kimberly Weaver

University of Pittsburgh Medical Center

This is a report of a community hospital group practice experience with singleincision laparoscopic cholecystectomy.

From July 2009 to August 2011, 300 patients (225 female and 75 male) underwent SILS cholecystectomy for biliary tract disease. No patients were excluded based upon BMI, age, prior abdominal operation, or preoperative diagnosis including acute cholecystitis. Questionnaires were sent to patients to evaluate pain, return to normal activities, as well as overall satisfaction with the procedure.

A significant learning curve was observed for this procedure. Median operative time overall was 49 minutes. The first 50 cases and last 50 cases had median operative times of 53 and 41 minutes, respectively. Ninetyone percent of cases were performed on an outpatient basis. There were no conversions to open cholecystectomy. One patient was converted to traditional laparoscopic cholecystectomy, while another required placement of a single additional trocar. Ninetythree percent of patients had documented cholelithiasis/chronic cholecystitis on pathology. Five percent of the procedures were performed for acute cholecystitis. The cost of SILS cholecystectomy was equivalent to traditional laparoscopic cholecystectomy.

Eightyfive percent of patients described less or equivalent pain when compared to previous operations. Ninetynine percent were pleased with the cosmetic aspect of the incision. Patients returned to normal activities within a week of operation. Ninetyfive percent described complete resolution of symptoms.

SILS cholecystectomy is an equivalent technique to traditional laparoscopic cholecystectomy in addressing symptomatic gallbladder disease and may emerge as treatment of choice as it offers improved cosmesis and decreased postoperative pain.

## **COMPARISON OF PULMONARY UPTAKE WITH TRANSIENT ISCHEMIC DILATION AFTER REGADENOSON TECHNICIUM<sup>99</sup> PERFUSION IMAGING.**

Farah Al Khitan

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Elevated lungheart ratio (LHR) and transient ischemic dilation (TID) have been identified as markers of severe coronary artery disease after both exercise and pharmacologic stress testing. Prior studies have demonstrated a very weak correlation between elevated LHR and TID after exercise, which suggests that they reflect different pathophysiologic manifestations of coronary disease.

Because the physiology of pharmacologic vasodilatation with Regadenoson is significantly different than that of physical exercise, we undertook this study to evaluate the relationship between elevated LHR and TID after pharmacologic stress testing with Regadenoson.

We analyzed 100 consecutive patients who underwent pharmacologic stress imaging with Regadenoson and Technicium<sup>99</sup> sestamibi, where LHR and TID were recorded. LHR and TID were calculated and compared with each other and with relevant clinical parameters. Variables considered were: Type of test, Age, perfusion results, the functional variables [SSS, SDS, and SRS), and the function gated variables {Gated EF stress [gEFs], and Gated EF rest [gEFr]}.

Abnormal TID (TID>1.20) was present only in women. TID was not statistical related to LHR ( $\chi^2$ ,  $p>0.05$ ). LHR>0.55 was not statistical related to gEFs<40% , or gEFr<35%. ( $p >0.05$ ), TID>1.20 was not statistical related to gEFs<40% , or gEFr<35%. ( $p >0.05$ ). There was no significant correlation between elevated LHR and TID and the severity of Technicium stress or redistribution scores.

Abnormal TID was present only in females. Both elevated LHR and TID have no significant correlation with each other. Both elevated LHR and TID have no significant correlation with the severity of coronary artery disease nor lower ejection fraction.

## EVALUATION OF STILLBIRTH

Melissa Goetter

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Despite revolutionary advances in the medical field, stillbirth remains a common occurrence in modern obstetrics. It occurs in 1 in 160 deliveries in the United States. Despite stillbirth being fairly common, there has been little advance in recent years preventing this devastating result from occurring. The most accepted definition of stillbirth is a fetus born at greater than 20 weeks gestation or 350 grams that shows no evidence of life which includes heart beat, respiratory effort, or pulsation of the umbilical cord. According to American College of Obstetricians and Gynecologists (ACOG) recommendations, the most important tests in the evaluation of a stillbirth are fetal autopsy; examination of the placenta, cord, and membranes; and karyotype evaluation.

This study was a retrospective chart review of the stillbirths greater than 20 weeks that occurred between 2005-2009 at our facility among all groups practicing. The groups were evaluated on compliance with ACOG guidelines on management of stillbirth. Maternal records, clinical files, pathology and laboratory results were reviewed for each case.

Fortyfive cases of stillbirths greater than 20 weeks were included between 2005-2009. Six groups of practicing obstetrical physicians were included. Autopsy was performed in 075% of cases depending on group. Chromosome analysis was performed on 45100% of cases depending on group. Placental pathology (which included infarcts, hematomas, abruption, and chorioamnionitis) was found in 36%100% of cases depending on group.

There was a large variation among the groups regarding workup for stillbirths. There needs to be more emphasis placed on gross evaluation including fetal autopsy and examination of the placenta, cord, and membranes, which is labeled by ACOG guidelines as pivotal in the evaluation of stillbirth. Evaluation of chromosomes was on average more commonly performed. In order to understand the mechanisms causing stillbirths, a more universal evaluation and continuity of reporting would be beneficial.

**EXTRASKELETAL EFFECTS OF VITAMIN D: POTENTIAL  
IMPACT ON WV DISEASE MORBIDITY AND MORTALITY**

Dana Lycans

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Huntington, WV

Vitamin D, a secosteroid hormone, is well known for its roles in bone health and calcium homeostasis; however, the effects vitamin D has on many “extraskkeletal” processes is significantly less wellunderstood. These effects are impacted by the circulating levels of the storage form of vitamin D, 25hydroxyvitamin D3, which can be detected with the simple 25(OH) D blood test. Deficiency of vitamin D, as indicated by less than 30 ng/ml, is associated with higher risk for many diseases including but not limited to 14 types of cancers, type 1 and 2 diabetes mellitus, obesity, cardiovascular disease, hypertension, cerebrovascular disease, and asthma. We explore the association of vitamin D deficiency and the burden of chronic diseases in West Virginia.

## **FALL PREVENTION THERAPY: VITAMIN D SUPPLEMENTATION**

Thomas Schlierf  
Marshall University

This review highlights studies showing the beneficial impact of various fall prevention therapies involving vitamin D supplementation for elderly men and women. Across the United States there has been a 50% increase in fall related hospitalizations from 2001-2008. Nationally, West Virginia ranks second in its percentage of population that is  $\geq 65$  years of age. This large population increases the risk of falls among the elderly in WV resulting in the need to establish fall prevention strategies.

Two metaanalysis studies of randomized controlled trials investigating the effect of vitamin D supplementation (with and without calcium) in fall prevention were reviewed.

It was found that vitamin D supplementation reduced fall risk in the elderly. Dosages of  $\geq 700$  IU vitamin D supplement and achieved serum 25(OH) D concentration of  $60 \text{ nmol/l}$  were found to be statistically significant in reducing fall risk. This effect was enhanced with calcium coadministration. Vitamin D supplementation with calcium coadministration should be implemented into fall prevention therapies in the care of those individuals making up the elderly population.

## **LOWER RADIATION EXPOSURE FROM MUSCULOSKELETAL COMPUTERIZED TOMOGRAPHIC SCANS MAY MEAN LOWER CANCER RISK FOR PATIENTS**

Megan D. Powers

Joan C. Edwards School of Medicine, Huntington, WV.

Concern over radiation exposure from Computed Tomography scans has become a recent growing public concern. Much of this concern is focused on the potential oncogenic effects of this type of radiation. Current research demonstrates that radiation exposure varies depending on the area of the body scanned. It has been demonstrated that musculoskeletal CT scans of the extremities may pose less of a risk than chest or abdominal scans because they expose the body to lower doses of radiation.

In order to assess the cancer risk of radiation exposure a unit of measurement referred to as “effective dose” is used. Millisieverts (mSv) are the units of effective dose and allow for a quantification of dose versus cancer risk. Much of the information on the hazards of radiation has been provided by epidemiological studies of individuals who survived the atomic bombs in Japan. These studies have shown that an acute exposure to ionizing radiation above 1050 mSv creates a risk of malignancy. More relevant to medical imaging, these studies led to the finding that a lifetime exposure to doses above 50100 mSv is significant for cancer risk.

To put these numbers into perspective the most frequently ordered imaging study is a posteroanterior chest radiograph which is known to have an effective dose of 0.08 mSv. A chest CT has an average effective dose of 5.27 mSv which is equivalent to the total effective dose of approximately 65 chest radiographs. A CT of the elbow has an effective dose of 0.14 mSv and one of the wrist and hand 0.03 mSv. Effective doses of 0.16 mSv and 0.07 mSv have been obtained for the knee and ankle respectively.

This data can be used to demonstrate that the cancer risk due to CT imaging is much lower for extremity scans.

## **NEUROPROTECTIVE EFFECTS OF PROGESTERONE IN TREATING TRAUMATIC BRAIN INJURY**

Rebecca Klug

Joan C. Edwards School of Medicine

Traumatic brain injury (TBI), is a major cause of morbidity and mortality in the US and throughout the world. The populations most at risk for TBI include: children, young adults, athletes, soldiers, and the elderly. Research to date has not resulted in any translational therapies that can be applied to clinical practice. Evidence suggests that progesterone may be a valuable treatment option for TBI. Laboratory studies have shown that progesterone has neuroprotective properties in the central nervous system. Following injury, progesterone promotes growth, acts as an antiinflammatory agent and antagonizes apoptosis. Marshall Neuroscience is currently investigating progesterone as a therapy for TBI through a clinical trial.

A phase II placebo controlled trial of progesterone showed a 50% reduction in the overall death rate, and a significant improvement in functional outcome and level of disability. Currently two multicenter phase III clinical trials, SyNAPSe and ProTECT™ are underway to determine if progesterone has a beneficial effect on brain damage following TBI. Marshall Neuroscience is participating in SyNAPSe which is a privately funded trial by BesinsPharma occurring in the United States and some countries in Europe and Asia. ProTECT™ III, is a NIHsponsored trial throughout the United States. Up to eight hours following TBI, progesterone is administered IV to the patient who is then followed for months to measure defined outcomes. The studies are designed to determine whether or not the patients treated with progesterone have an improved outcome with decreased morbidity and mortality.

This review provides an overview and explanation of the neuroprotective properties that progesterone exhibits in the central nervous system and a rationale for its use as a neuroprotective treatment for TBI. Additionally, the clinical trials and their protocols will be described for better understanding of the safety, efficacy and expected outcomes of this treatment.

## **PERSONALIZED CHEMOTHERAPY IDENTIFIED FOR A CASE OF RECURRING SPINAL EPENDYMOMA**

Sarah Mathis

McKown Translational Genomic Research Institute, Marshall University,  
Joan C. Edwards School of Medicine, Huntington, WV

Administration of ineffective anticancer therapy is associated with unnecessary toxicity and development of resistant clones. Many attempts have been made over the years to develop an exvivo anticancer test that would provide clinically relevant treatment information. Each time patients are treated, they have a high chance of relapse and their cancer may become more resistant to therapy.

Unlike bulk of tumor cells, cancer stem cells (CSCs) resist chemotherapy and can regenerate the various cell types in the tumor, thereby causing relapse of the disease. Thus, development of a test that identifies the most effective chemotherapy management offers great promise for individualized anticancer treatments.

The test we developed (ChemoID) involves growing primary cell cultures from tumor biopsies. CSCs are then isolated using a rotating wall bioreactor and immunophenotyped by flow cytometry. Both bulk of tumor cells and CSCs are exposed to a variety of chemotherapeutic agents in a range of concentrations. A full doseresponse curve is generated for each drug evaluated, and the data are presented as a cytotoxic index (% kill). A 19yearold patient affected by a recurring undifferentiated spinal ependymoma was biopsied in July 2009. The primary cell culture obtained was immunophenotyped showing an elevated percentage of CD133(+) cells. Patient had already been treated in the past three years by cyber knife, surgery, and several chemotherapy regimens, but was recurring on average of 35 months.

ArabinosideC, busulfan, cisplatin, CPT11, etoposide, methotrexate, and oxaliplatin were tested in various concentrations flanking the clinically relevant doses. ChemoID determined that the most effective treatments for this ependymoma were CPT11 or Cisplatin as measured on both bulk of tumor cells and CSCs. Patient was treated with a regimen of CPT11, and showed no disease progression for 18 months.

More testing is needed for this new assay that could lead to more effective anticancer treatments.

## **PREVENTIVE CARE SERVICES AND DEMENTIA**

Piyush Sovani

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Huntington, WV

Preventive care medicine comprises a variety of measures aimed at avoiding diseases, rather than treating diseases once established. Because of our interest in the health of elderly demented patients, we investigated utilization of preventive measures in this group and hypothesized that patients afflicted by dementia may not receive as many preventive care services as patients without dementia.

We conducted a retrospective chart review of a randomly selected group of 100 dementia patients from among patients with an ICD9 diagnosis of 290.0 or 331.0 who were over age 65 years at the last service and were seen since 2007 when our electronic health record began. Of the original 100 patients, we included in the study group only subjects who had a Folstein minimal status score less than 24, which was 38 patients, and an age and sex matched control group.

We found that 40% of the nondemented control group had Dual Xray Absorptiometry (DEXA) scans ever compared with only 16% of the dementia group ( $p=0.04$ ). Moreover, only 3% of the dementia group had DEXA scans in the past 3 years compared with 24% of nondementia patients ( $p=0.01$ ). Other preventive care services including mammograms, prostate and breast examinations, hemocult cards, colonoscopy, calcium and vitamin D supplementation, PAP smear and influenza, pneumococcal, Herpes zoster and tetanus immunizations did not differ significantly between the two groups.

Of 13 preventive care services, only bone density screening was done significantly less often in dementia patients. This is of great concern since dementia patients are more prone to falls and often suffer osteoporosis, a combination which increases their risk of hip fracture and the likelihood of transfer to a long term care facility. We conclude that physicians should recommend DEXA scans more often for their elderly demented patients.

## **QUANTITATIVE ANATOMY OF THE LUMBAR INTERVERTEBRAL DISC PART 1**

Ken Maynard

1 Marshall University School of Medicine, 2 Huntington Veterans Administration Medical Center, 3 Department of Radiology Cabell Huntington Hospital.

The quantitative anatomy of the lumbar spine is in need of better refinement. Studies devoted to this subject are rare, and our review of the medical literature in the clinical, as well as the basic sciences, has discovered little information. This happens at a time when spinal surgery is trending toward motion preservation rather than fusion. Though the transition is taking longer, this trend parallels what occurred years ago in peripheral joint surgery.

The cervical discs carry little weight and are quite mobile in all directions. The thoracic spine is attached to the thoracic cage resulting in minimal movement. The lumbar spine offers the biggest challenge by associating significant movements and is the most weight bearing, and this level is the primary focus of our study.

This presentation is concerned with preliminary results from measurements of lumbar discs performed on MRIs reported as “normal” by a boardcertified radiologist, with all identifying information removed. Measurements were performed on axial images where the demarcation between the nucleus pulposus and annulus was discernible.

The overall disc size was found to increase between L1 and L5, but the disc between L5 and S1 was markedly smaller. The size of the nucleus remained constant through these levels. Results are presented in graphic form, and significance of these results are discussed.

In addition to CT and MRI measurements, we plan to perform 3D reconstructions of the intervertebral discs, differentiating the annulus and nucleus, enabling us to measure the volume of both structures as well as the total disc. Validity of data shall be confirmed by cadaver dissections. The 3D reconstructions are presented in short video format.

**RETROSPECTIVE CHART REVIEW OF SINGLE PHYSICIAN/  
INSTITUTE EXPERIENCE WITH ROBOTIC GYNECOLOGIC  
SURGERY TO DETERMINE IMPACT ON RATE AND REASON  
FOR ABDOMINAL HYSTERECTOMIES**

Mohamed Foda

MUSOM

Robotic techniques are increasingly being used to perform gynecologic surgical procedures including hysterectomies, performed for benign and malignant indications, myomectomies, tubal reanastomoses, and sacrocolpopexies. Robotic procedures seem to confer the same benefits as laparoscopic surgery without additional complications. The advantages to robotic surgery include improved visualization of the operative field with increased dexterity allowing more precise movements. Disadvantages include the learning curve associated with learning a new surgical technique and the equipment and operating costs of the robot and of using the robot. A retrospective chart review of all RALH was performed. All cases will be compared with a matched control group of standard TAH, VH and LH.

A total of 1243 hysterectomy cases were studied, comparison points will include preoperative indication and workup, preoperative pathological or radiological diagnosis, risk factors for surgical complications, intraoperative findings, intraoperative blood loss, postoperative hospital stay and complications, final pathological diagnosis. Research and Data Analysis In process.

## **THE IMPACT OF COMPUTER ASSISTED LEARNING IN PEDIATRICS PROGRAM (CLIPP) CASES ON PEDIATRIC MINIBOARD SCORES**

Vishnu Garla  
MUSOM

The pediatric clerkship is one of six 8week MS3 rotations at our medical school. CLIPP cases were introduced into the pediatric clerkship curriculum in 2007 to enhance active and independent learning opportunities. Students are required to complete 31 online interactive patient cases and pass a CLIPP case final exam as part of their overall pediatric clerkship grade. The objective of this study was to assess the impact of CLIPP cases on pediatric miniboard scores.

Pediatric miniboard scores of all MS3 students from academic years 2004 to 2010 were collected which provided a data set of three years of miniboard scores before (2004-2006) and after (2007-2010) the introduction of the CLIPP cases. Data was analyzed to determine the impact of CLIPP cases on miniboard scores.

There were 112 students before and 213 students after the introduction of CLIPP cases who took the pediatric miniboard exam. The average miniboard score was 75(Standard deviation 8.23) in the before group and 76(Standard deviation 7.07) in the after group ( $p=0.36$ ). Further analysis revealed that the miniboard scores did not change significantly as the years were compared to each other.

Comparison of overall miniboard scores revealed that the mean scores consistently increased throughout the academic year with each rotation except for the last one. There was no significant change in the mean board score by rotation in a multiple linear regression model that included the academic year. There was no difference in mean board score by academic year.

Our study shows no association between the introduction of CLIPP cases and MS3 pediatric miniboard scores. Pediatric miniboard scores increased through any given year with the exception of the last rotation. There was no significant change in the pediatric miniboard scores through the years the study was done.

## **A UNIQUE GLOBAL HEALTH DIDACTIC COURSE FOR PRECLINICAL MEDICAL STUDENTS AT MARSHALL UNIVERSITY**

Richard G. Erwin

Joan C. Edwards School of Medicine at Marshall University

Global health is well recognized to be an important component of U.S. undergraduate medical education. Almost every U.S. medical school now offers its students global health courses in some fashion or another. However, no medical school appears to offer a brief, intensive didactic course encompassing both biological and other determinants of health designed for application to reallife scenarios in resourcepoor global contexts by preclinical medical students.

In this poster we describe a course, “Human Behavior and Disease in Tropical Developing Countries” (FCH 735) offered at Joan C. Edwards School of Medicine (JCESOM) that fits these criteria. We also report how it is perceived by participating students. The course, taught by a family physician from the Department of Family and Community Health (DN), is offered to medical students at JCESOM as a fortyhour, oneweek summer elective after the first year. Nine students’ reactions to the course were explored confidentially by a second year medical student who had not taken the course (RGE) using semistructured interview techniques. Deidentified transcripts of the interviews were used to identify and sort recurring themes.

The students’ comments sorted into two themes. First, that the course enabled them to “think like clinicians,” forming and flexibly refining diagnostic impressions with new information. Students also pointed to increased appreciation of how nonbiological factors that influence personal and communal human behavior play a major role in the control and prevention of disease.

FCH 735 is a unique global health course offering that in one week combines attention to biological and other determinants of health so as to equip medical students to apply their knowledge to reallife clinical scenarios after only one year of medical school. Replication and application of the course’s methodology to other aspects of preclinical medical school curriculum might be beneficial.

## **NATIONAL PEDIATRIC NIGHTTIME CURRICULUM FIELD TEST**

Awni Al-Subu, MD; Mohammed Ebraheem, MD; Susan Flesher, MD

Providing residents with an academic and clinical education must be carefully planned and balanced with concerns for patient safety, resident well-being and education. Starting on July, 2011 each residency program must follow strict working duty hours that will force must pediatrics programs to change their working schedule to a 12 hour night and day shifts, ensure that the learning objectives of the program are not compromised by excessive reliance on residents to fulfill service obligations and to ensure that the learning objectives of the program continue during night time the need for a curriculum and teaching plan raised. One of these educational curriculums is the National Pediatric Nighttime curriculum. This curriculum has been a collaborative effort between the APPD Curriculum Task Force and the Pediatric Hospital Medicine Education Task Force (AAP, APA, and SHM-collaboration).

The curriculum will consist of 2 parts:

1. Web-Based Curriculum
2. Field educational models.

In order to assess the beneficiary of this curriculum a field test will be conducted, in which a pre and post testes will be conducted. This a multicenter projects and a total of 25 programs will be included.

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